

JPRS 80474

1 April 1982

USSR Report

CONSTRUCTION AND EQUIPMENT

No. 59



FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

1 April 1982

USSR REPORT

CONSTRUCTION AND EQUIPMENT

No. 59

CONTENTS

CONSTRUCTION

Deminov on 1982 Program of Start-Up Projects (A. D. Deminov; STROITEL'NAYA GAZETA, 3 Jan 82).....	1
All-Union Conference Discusses Problems, Status of Wood Concrete (R. P. Antonova; BETON I ZHELEZOBETON, Dec 81)	6
Working of New Construction-Management System in Estonia Reported (A. Gellart; SOVETSKAYA ESTONIA, 31 Jul 81)	8
Control of Improvement of Kazakh Construction Work Urged (A. Mikhel'; NARODNOYE KHOZYAYSTVO KAZAKHSTANA, No 4, 1981)	12
Improving Construction Machinery Use Efficiency (A. Lebedev, N. Khomyachenko; PLANOVOYE KHOZYAYSTVO, Feb 82)	20
Economist-Designers Want Better, More Complete Baseline Data for Construction (G. Shpykov; EKONOMICHESKAYA GAZETA, Jun 81)	26
Subsidiary Papers Issued by Construction Designers Criticized (B. Kaplun; SOTSIALISTICHESKAYA INDUSTRIYA, 8 Jul 81) ...	30
Better Preparation, Coordination of Construction Designs Urged (I. N. Dmitriyev; EKONOMICHESKAYA GAZETA, Jul 81).....	33
Model Rural Construction, Renovation Projects (STROITEL'NAYA GAZETA, 6, 15 Jan 82)	39
Rural Experimental Construction, by A. Isayev Rural Renovation, G. Fomin Interview	

Novosibirsk Building Unit Reorganizes To Manage Resources Better (V. Sharapov; EKONOMICHESKAYA GAZETA, May 81)	44
Work of Economic Services of Some Komi Construction Units Not Realistic (N. Subbotin; EKONOMICHESKAYA GAZETA, May 81)	46
Architectural Progress in Three Middle Ob' Region Cities Described (A. Antonov; ARKHITEKTURA SSSR, No 2, 1980)	49
Table of Contents: 'STROITEL'NAYA MEKHANIKA I RASCHET SOORUZHENIY,' 1981	54

BUILDING MATERIALS

Greater Use of Heat-Resistant Concretes at Hot Spots Urged (Editorial; BETON I ZHELEZOBETON, Dec 81)	61
Briefs Panel Plant Under Construction	64

CONSTRUCTION

DEMINOV ON 1982 PROGRAM OF START-UP PROJECTS

Moscow STROITEL'NAYA GAZETA in Russian 3 Jan 82 p 2

[Article by USSR Gosstroy First Deputy Chairman A. D. Deminov: "New Stage of Creation"]

[Text] The new-year's congratulations of the CPSU Central Committee, USSR Supreme Soviet Presidium and USSR Council of Ministers elicited a lively response in the hearts of millions of Soviet people. It is with a sense of optimism and confidence that they are looking forward and fighting to successfully carry out the resolutions of the 26th Party Congress.

Much good work was done this past year. Some 138.6 billion rubles was directed into developing the national economy. Such major projects as the fifth lead power unit of Novovoronezhskaya AES and the first at Rovnenskaya AES, the Surgut-Polotsk trans-continental pipeline, Prikumskiy Plastics Plant, Pridonskiy Chemical Plant and others were put into operation. Housing conditions were improved for hundreds of thousands of families.

The frontiers of the second year of the five-year plan and the five-year plan as a whole were precisely defined by the November (1981) CPSU Central Committee Plenum and the 10th convocation of the sixth USSR Supreme Soviet session. Intensive development of the national economy so as to ensure continued improvement in the well-being of the Soviet people was outlined. The total volume of capital investment will be 137.4 billion rubles. National income must increase by three percent and, as we know, by 18 percent for the five-year plan as a whole, given 10.4 percent growth in capital investment. This is the first time such a high return on expenditures has been planned. There is a realistic basis for achieving it, as more careful consideration was given to material and labor resources, the capacities of construction organizations and other reserves when working out the plan. The branch production program reflects the decisive steps taken by the party and government to concentrate capital investments and accelerate the construction and renovation of projects to put them into operation.

Much attention is paid in the national economic plan for the new year to further developing socialist industry. Tens of billions of rubles have been allocated for this purpose and more funds are being directed into renovating and retooling existing enterprises. We plan to increase the proportion of expenditures on equipment, the active portion of fixed assets. Total state expenditures on producing and installing equipment will be 48.4 billion rubles, which will be 39.8 percent of all capital investment.



Key:

1. Nuclear power plants
2. Thermal electric power plants
3. Hydroelectric power plants
4. Ferrous and nonferrous metallurgy
5. Coal industry
6. Chemical and oil refining industry
7. Pulp-paper and wood-processing industry
8. Machinebuilding
9. Building materials and components
10. Light industry
11. Elevators and mixed-feed enterprises
12. Food industry
13. Stockraising complexes
14. Poultry farms
15. Gas pipelines
16. Renovation of existing enterprises

Special importance is being attached to developing the base branches, foremost fuel and energy. Significant growth in coal mining, petroleum and gas extraction and electric power generation has been anticipated. This year, electric power production is to reach 1.365 billion kilowatt-hours, a 2.6 percent increase over last year. Nuclear power plant generation will increase at outstripping rates, a 24 percent increase over 1981. The list of start-up AES facilities includes three units of the first line at Kalininskaya AES and the second line at Chernobyl'skaya AES, four units at Kolym'skaya and Kurp'skaya GES's and Shamkhorskiy hydrosystem. Thermal electric power generation capacities will be increased. Capacities at the Primorskaya, Azerbaydzhanskaya and Ekibastuzskaya GRES's will be expanded.

The main petroleum, gas and coal projects to be installed will be in Siberia. We plan to increase petroleum extraction in Tyumenskaya Oblast and anticipate expanded catalytic cracking. To this end, capacities will be increased at Pavlodarskiy and Moscow oil refineries.

Much development of the Kansk-Achinsk coal complex is planned. The "Neryungrinskiy" (first line) reserve in Yakutskaya ASSR, "Pavlovskiy No 2 in Primorskiy Kray, "Tyul'ganskiy" (first line) in Orenburgskaya Oblast and "Zapadno-Donbasskaya" mine Nos 21/22 must become operational. The total increment in coal mining capacities will be 17.1 million tons.

The 1982 plan is to extract 492 billion cubic meters of gas. In order to deliver it to consumers, we are faced with laying another 7,800 kilometers of gas pipelines and branch lines. Completion of work on building the Urenga - Peregrebnoye - Nizhnyaya Tura - Petrovsk 3,019 kilometer gas pipeline will be a most important event. Sectors of the Urenga - Nizhnyaya Tura - Petrovsk - Novopskov and Mozdok - Kazy - Magomed - Torzhok - Minsk - Ivantsevichi (third thread) gas pipelines are start-up projects.

As before, the task of increasing metal production and improving its quality is most important. Annual pig smelting has been set at 113.7 million tons, steel -- 156.2 million tons, rolled metal -- 108.5 million tons and steel pipe -- 18.8 million tons. In order to provide all enterprises with ore, we must make operational the Kostromukshskiy Ore Enrichment Combine in Karelian ASSR and the Stoylensk ore administration in Belgorodskaya Oblast. The general-purpose beam mill at Nizhnye-Tagil' Metallurgical Combine imeni V. I. Lenin and a multilayer pipe production department at Vyksunskiy Metallurgical Plant are start-up projects.

Chemical and petrochemical industry will be developed rapidly. Mineral fertilizers production will be 119.1 million tons (reference units). New capacities to produce synthetic ammonia are to be put into operation in the "Angarsknefteorgsintez" (Irkutskaya Oblast) and "Azot" (Kemerovskaya Oblast) associations, as are mineral fertilizers production capacities at Meleuzovskiy Chemical Plant (Bashkir ASSR) and Novo-Solikamskiy Potassium Fertilizers Plant (Permskaya Oblast).

Machinebuilding is properly considered a base branch, as it plays a top-priority role in retooling the entire national economy. It is necessary to take every step possible to ensure the planned increment in this important output. Deliveries of highly productive new equipment to fuel and energy projects, rail transport and agriculture must be increased. We are preparing to put into operation a number of major construction and renovation projects in this branch at Ivano-Frankovskiy Machine Press Plant, "Elektrotyazhmash" plant in Khar'kov, Novocherkasskiy Electric Locomotive Plant, "Gomsel'mash," and other enterprises.

The social development program outlined further growth in consumer goods production. Given a 4.6-percent growth in cotton fabrics production in light industry, the release of cotton print fabrics will be increased by 6.7 percent, of linen by nine percent and of satin by 7.5 percent. Production of other output in demand will also be expanded -- wool, silk, flax, linen and knit outerwear and leather footwear. The demands of the population will be better met by the new production facilities to be put into operation at cotton combines in Bukhara, Andizhan, Tiraspol', a cotton-spinning combine in Dzhizak and a knitwear factory in Kirovkan.

Facilities to produce canned goods, process milk and produce furniture, dishes and household chemical products will be increased.

As before, particular attention is being paid to improving living conditions. As in previous years, we have planned a large housing program which is closely linked to industrial construction plans. We are faced with building a total of 106.9 million square meters of housing space. About 10 million people will move into new residences.

Growth in the well-being of the Soviet people depends on the labor results of agricultural workers. The policy adopted of intensifying agriculture obligates us to ensure the proportional, balanced development of all branches of the agroindustrial complex. A significant portion of the funds allocated for these purposes is being directed into creating capacities to produce means of production and facilities for storing agricultural produce. Total capital investments in developing agriculture will be more than 37 billion rubles. We are faced with finishing construction of large elevators in Saratovskaya, Volgogradskaya and Kokchetavskaya Oblasts, a mixed feed plant in Mirgorod, Poltavskaya Oblast, a grain-products combine in Kapchagay, Alma-Atinskaya Oblast, and other projects. Among the start-up products are dozens of stockraising complexes, poultry farms, hothouses and mills.

The rapid growth of the Soviet economy and expansion of economic ties require the continued development of transport on a modern technical basis. We are faced with much work on improving it. The start-up of the new 303-km Urgal - Berezovka BAM sector and track electrification of the Tselinograd - Kokchetav mainline are planned.

Successful implementation of an enormous creative program is unthinkable without expansion and updating of the production assets of construction and building materials industry. More than four billion rubles has been allocated for further strengthening the production-technical base for builders. The creation of new and renovation of existing enterprises will permit raising the level of construction industrialization, expanding the use of effective new materials and components.

These comments naturally note only some of this year's start-up projects. The program of creative work is broad, encompassing all branches of the national economy. In order to cope with it successfully, we need to achieve in fact fundamental advances in capital construction, as was stated at the November (1981) CPSU Central Committee Plenum. We need to do everything possible to carry out the measures to concentrate efforts and funds at start-up projects, accelerate putting fixed assets into operation and reduce the amounts of unfinished construction and above-normative uninstalled equipment inventories.

There is no need to prove that construction can be accelerated with minimum expenditures only on the condition that labor productivity growth assignments are successfully

met. This obligates all branch workers to resolutely arm themselves with everything new and advanced, to support and develop valuable experience, progressive and creative initiatives.

All capital construction sectors have large reserves for saving labor, materials and financial resources. Using them means working as the party demands -- better, more efficiently, with a higher return, and achieving successful fulfillment of the assignments of the second year of the five-year plan.

11052

CSO: 1821/74

CONSTRUC

ALL-UNIO

Moscow
p 38

[Article]

[Text]
duction
structio

Taking
of vario
ways for
and for
articles

Sixteen
of Pulp
of Inter
Construc
for Conc
and othe
pects fo
cles mac
and use
status

Themes
articles
design-o
nology
of tests
increase

The cont
construc
other lo
aluminat

The recommendations adopted at the conference were aimed at further developing scientific-research, experimental and design work, the production and use of wood-concrete structure and articles in construction, increasing their effectiveness and quality, and mastering existing capacity for the manufacture thereof.

The work of the All-Union conference took place in a creative, businesslike atmosphere.

COPYRIGHT: Stroyizdat, 1981

11409

CSO: 1821/066

WORKING OUT NEW CONSTRUCTION-MANAGEMENT SYSTEM IN ESTONIA REPORTED

TALEBAYE KUYERBAYEVA ESTONIA IN RUSSIAN 37 JUL 81 p 2

[Article by A. Gellart, manager of the Estonian Republic Office of SSSR Struybank: "For the Final Result"]

FIGURE 1. Working in every possible way the effectiveness of capital investment by continually improving construction work, restricting the number of jobs being built simultaneously, reducing time for erecting facilities, and introducing production capacity and facilities for the reproduction sphere uniformly over the year--this is the task of the day.

The amount of incomplete construction and reserves of uninstalled industrial equipment must be brought down to the standards in that manner in the next few months.

The system of measures for improving the economic mechanisms should help. Beginning in 1981, the introduction of production capacity and facilities into use and the volume of construction commodity output, that is, the value of the construction and installing work at enterprises, plants and startup complexes and facilities that are ready to produce output or extend services, have become the basic indicators for evaluating the activity of and for controlling contracting construction organizations. These indicators reflect people in the final results of construction work in increasing its effectiveness.

The goal of the construction of all contracting organizations is settlement with all work for construction commodity output should be completed. When preparing for payment, it should correspond to the value determined by the design. This amount is transferred for the whole construction period and is transferred to the contractor in the full amount if the work is carried out in accordance with the design. If the contractor achieves a saving as a result of measures taken that have been confirmed by the client, then the saving is left at the builders' disposal. Revision of the work during construction is not permitted except where the design is revised because of the use of more modern equipment or more progressive technology.

Measures on the work of state acceptance commissions have now been intensified. The construction can accept production facilities for operation only if under work is effected and production of the output called for by the design has begun on the installed equipment in the amount that corresponds to the norms for mastering design capacity during the initial period.

With conversion to settlements for construction commodity output, the role of credit is raised considerably. It is becoming the main source for forming the working capital of contracting and design organizations.

Clients' issuances of advances to contracting organizations for expenditures for uncompleted performance of construction and installing work ceases. These expenditures are covered by bank credits until the completion of construction and the receipt of payment from the clients.

If the planned deadline for turnover of construction commodity output has not been met, the bank continues to grant credit for expenditures, but now with a higher interest rate imposed for use of the loan (4 percent per annum versus the 0.5 percent imposed prior to expiration of the planned deadline).

If the construction deadline has not been met because of the fault of a subcontracting organization or the client, then, in addition to penalties for nonfulfillment of contractual obligations, the general contractor has the right and should demand from the guilty parties reimbursement for the losses suffered because of payment of the higher interest rate for credit. In his interesting article, "The New Mechanism in Action," (SOVETSKAYA ESTONIYA of 11 July 1981), deputy manager of Tallinn Construction Trust N. Polupanov speaks, unfortunately, only about penalties, forgetting the possibility of reimbursement for losses.

Credit to cover expenditures for uncompleted operations is issued to contracting organizations through the funds that the client releases in connection with the conversion to settlements without intermediate payments.

State bank institutions, when they grant credits, are obliged to strengthen monitoring of the observance of state discipline in construction, using financial and credit-granting measures to preclude cases of the execution of construction outside the plan, the acquisition of supply, equipment and labor resources in order to work at a higher level on facilities that are not due for early startup than on facilities due for early startup, and the conduct of operations at construction projects that have not been accepted by the bank for financing.

The experience of Estonian SSR Ministry of Construction contracting organizations that transferred back in 1980 to the evaluation of activity and to settlements in accordance with construction commodity output indicated a number of important deficiencies in practical introduction of the new system. The clients had not made up for most construction projects lists of the content and the cost of the commodity output. Plans for turning over construction commodity output that were approved by the ministry for subordinate contracting organizations proved to be low in comparison with the plan for economic and social development. As a result, for Estonian SSR Ministry as a whole, the plan for commodity output was overfulfilled 104.0 percent, despite the fact that many facilities that were supposed to be turned over had not actually been turned over for operation, and expenditures on facilities that were turned over late, for which credit had been granted at an increased interest rate, exceeded 16 million rubles at the start of the year.

At individual construction projects, the clients--the Tallinn and Kokhtla-Yarve city sovetkoms, the Plant imeni M. I. Kalinin, and the Volta and Punane Kunda plants--had not assigned the necessary monetary means as resources for the granting

on credit for uncompleted work versus the amount of construction and installing work actually carried out.

Contracting organizations have not been restructuring their operations in accordance with the new conditions, have not achieved a proper concentration of resources at construction projects due for early startup, and, as a result, are suffering considerable losses because of paying the bank higher interest on credit.

An analysis of the observance of construction deadlines indicates that the erection of most construction projects and facilities is taking much longer than the standard periods, an indication of inadequate concentration of capital investment at an optimal number of facilities being built simultaneously.

As the papers on selected investigations of facilities that were introduced in 1980 indicate, many took much longer than the standard construction time to build. The greatest deviations took place at rural-construction trust organizations. Construction time at the Parnu PMK [Mobile Mechanized Column] actually averaged 117 months where the standard construction period was 27 months, and the coefficient of capital investment concentration (the ratio of the average standard period to the actual) was only 0.23. This coefficient was 0.39 for the Khaapsalu PMK, 0.5 percent for the Vil'yandu PMK, and so on. As is evident from these data, average construction time at the organizations named exceeded the standard 2-fold to 4-fold.

At the same time, for example, the Tallinn Housing Construction Combine is greatly outstripping the standard periods for introducing all apartment houses 2-fold or more in some cases. This is what can and should be matched.

Tallinstroy, the Narva General Construction Trust and Tartustroy [Tartu Construction Trust], which had coefficients of capital-investment concentration of, respectively, 0.75, 0.72 and 0.56 in 1980, have substantial reserves for further concentration of capital investment.

Improvement of the economic mechanism is based upon the need for substantial improvement of economic work in contracting organizations and at construction projects and on a deepening of economic analysis of economic and financial activity, with a view to improving the management of construction and to raising its effectiveness on that basis.

Experts have indicated that some of the causes of the nonfulfillment of plans for capital construction are the unsatisfactory work of contracting organizations, deficiencies in the use and preservation of material resources, overconsumption of materials in comparison with the norms, and unsatisfactory organization of work, but not interruptions in supply or the provisioning of labor resources, as certain economic supervisors frequently try to plead.

A chronic reduction in the utilization effectiveness of fixed capital and in the profitability of construction operations and nonfulfillment of tasks for labor productivity growth have still not become the subject of study by the economic and control services of Estonian SSR Ministroy and subunits subordinate to it. Here they have become accustomed to the thought that reduction in yield on capital (the amounts of construction and installing work per ruble of fixed capital) from 1.01 rubles in 1975 to 0.7 ruble in 1980 is a phenomenon almost completely legitimate. Or to the fact that the prime operating cost of construction and installing

work records in some cases the budget-estimated cost by 25-35 percent, or that there is an annual increase in the number of organizations with planned losses.

Experience indicates that the skillful use of economic levers and stimuli is a most important prerequisite to organizational work in fulfilling the tasks of state planning for economic and social development. However, the effectiveness of their influence on the development and fulfillment of the plan depends greatly upon the quality of the plan itself. If the plan is not balanced and production and financial indicators are poorly substantiated, or have been determined only on the basis of reporting, then, whatever the economic levers that have been enlisted to stimulate economic activity, they cannot make up for deficiencies of the planning itself and their effect will not, to a great extent, achieve the final purpose.

Deficiencies in the practice of planning construction operations are now greater than in any other branch of the national economy. This is reflected in the non-coordination of plans for survey-and-design work and plans for capital investment with the plans for contracting operations, and in planning wage funds in accordance with the "base" rate without taking into consideration changes in the structure of the work being done because of its labor intensiveness. In many cases plans for contracting work do not call for the normal backlog of construction work performed in order to insure rhythmic operation at the start of the year, which leads to great losses of labor and to the irregular introduction of jobs.

At the Pärnu PMK of the rural construction trust, for example, the backlog of work performed at facilities that are being carried over into 1982 was planned to be less than 10 percent of the annual work volume, and for the Vil'yandi PMK of this trust, a backlog of 5 facilities with an engineering preparedness of 5 to 16 percent of their budget-estimated cost was called for. The Tartu DSK [Housing Construction Combine] has planned an engineering readiness of 20 percent of the budget-estimated cost for the backlog of work done on housing at the end of the year, and a maximum readiness per apartment house of 49 percent. It is asked, how will these contracting organizations use finishers, plumbers, carpenters and electricians at the start of 1982?

This is why improvement of planning at all levels has become the main, basic thing in the measures now being taken to strengthen the influence of the economic mechanism, its economic levers and incentives for increasing production effectiveness and the quality of the work.

Further development of the cost-accounting principles of management and a strengthening of the role of economic levers and incentives cannot in and of themselves automatically insure improvement of the final results of capital construction. These are only the organizational prerequisites for developing and executing measures for raising its effectiveness, based upon an analysis of the results achieved and a manifesting of creative initiative and activeness.

11409
0001 1821/054

CONSTRUCTION

CONTROL OF IMPROVEMENT OF KAZAKH CONSTRUCTION WORK URGED

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 4, 1981 (signed to press 9 Apr 81) pp 40-44

[Article by A. Mikhel', construction engineer: "Two Trusts--Two Results"]

[Text] The organizational structure of construction work is complicated and multiple-level. The number of economically separate organizations that are participating in construction of even the most ordinary housing and nonindustrial facilities is 10, while at industrial facilities there are 20 or more subunits of various agencies. And this multiplicity of elements in and of itself engenders a number of complicated management problems.

Let us take, for example, specialization. In principle, the division of labor by type of work leads to increased and better quality of output. But, at the same time, growth in the number of specialized subcontracting organizations complicates control and coordination of the actions of interdependent entities and leads to deficiencies in work organization and the use of mechanisms, which, in the final analysis, tell negatively on both the pace and quality of the work and prolong construction time.

In brief, at each stage in the development of construction work the question always arises of the optimally desirable limits of specialization. However, in practice it does not turn out to be simple to determine this optimum. Therefore, it is sensible to examine certain aspects of this problem in the example of the economic and production activity of specific construction trusts--Tselintransstroy [Tselinogradskaya Oblast Transportation Construction Trust] of USSR Mintransstroy [Ministry of Transport Construction] and Tselinogradtyazhstroy [Tselinogradskaya Oblast Trust for the Construction of Heavy Industry Enterprises] of Kazmintyazhstroy [Kazakh SSR Ministry of Construction of Heavy Industry Enterprises].

Both trusts have been stationed in Tselinograd. Subunits of the first are erecting various facilities for production, social, cultural and personal-amenity purposes in three oblasts, and the second is doing the same, mainly in Tselinograd, and only 1 percent of its annual program is at Atbasar and Makinsk.

Both are general-contracting trusts, have approximately identical amounts of construction and installing operations, and are in equal situations in regard to supply, equipment and labor resources provisioning. And, what is more, from some standpoints Tselinogradtyazhstroy is in an even better position. However, the trusts are operating in manners that are far from identical.

Tselintransstroy's activity is marked by stability in plan-indicator fulfillment and by high work quality. Tselinogradtyazhstroy's, on the contrary, is marked by instability, chronic nonfulfillment of tasks, and low quality. The data from an analysis of the trusts' work during 1978 is convincing of this.

During the period being analyzed Tselinogradtyazhstroy did 4.3 million rubles' worth of construction and installing work per 1 million rubles of fixed capital for construction purposes (after deduction for wear), while Tselintransstroy did 2.3 million rubles' worth, that is, more than twice as much. Labor productivity per worker in Tselinogradtyazhstroy, computed in accordance with an indicator of standard-equivalent net output, is 94.5 percent of the analogous indicator for Tselintransstroy. And this where the facilities being erected by the latter are scattered over 3 objects.

What kind of conclusions does the analysis suggest? The main one is that the nub of this situation lies not in the objective but in the subjective circumstances—a different level of organization and management of construction operations.

Let us descend several steps of the management hierarchy for the following analysis. Let us take a look at how the low-level management elements have been operating in the construction of two apartment houses in Tselinograd that are almost identical. Builders of Tselinogradtyazhstroy's Gorzhilstroy (Urban Housing Construction Administration) SU (Construction Administration) erected a 70-unit apartment house in the southeastern part of the city. Tselintransstroy's SMP-638 (Construction and Installing Train No. 638) built a 75-unit apartment house in block 168a.

Tselinogradtyazhstroy's Gorzhilstroy SU (1) was the general contractor for 70-unit apartment house No. 22. Under subcontract were an Adelstroy (Finishing-work Administration) SU (2), a Sanitchmontazh (Sanitary-Engineering Equipment Installing Administration) MU (Installing Administration) (3), an Elektromontazh (Electrical-Equipment Installing Administration) MU (4), Kazgazstroyemontazh (Kazakh Gas Construction and Installing Administration for Gas Equipment) (5), a Spetsstroy (Administration for Special Construction Work) SU (6), a mechanized-operations administration (7), a heat-insulation work administration (8), PMK-1 (Mobile Integrated Mechanization Column No. 1) Svyaz'stroy (9) and a Gorzelensstroy (Urban Landscaping Administration) (10). A total of 10 partners, not including the client.

In erecting the 75-unit apartment house in block 168a of Tselinograd, SMP-638 (1) played the role of general contractor and had the following subcontractors: SMP-49 (Construction and Installing Train No. 49) (2), PMK (Mobile Mechanized Column) (3), Ingaz (4), a communications section (4), a heat-insulating work administration (5), Vodrem-45 (6), a mechanization administration (7), and a Zelensstroy (Landscaping Administration) (8). Eight organizations, all told.

Let us review now the coordination of the construction participants. At the 70-unit building, subunits 1, 2, 6 and 7 were part of Tselinogradtyazhstroy Trust, while 3, 4 and 8 belonged to the republic's Minmontazhspetsstroy (Ministry for Industrial Construction and Special Construction Work) and 5, 9 and 10 belonged to other agencies. Let us go farther along the chosen path. Operations within the building were performed by organizations 1, 2, 3, 4, 5 and 9, outside the building by organizations 1, 3, 4, 5, 6, 7, 8, 9 and 10. This is a fairly complex network of interrelationships and mutual interdependencies, even for a simple job.

Let us present graphically in Figure 1 the ties that arise inside the building while operations are being performed by subunits 1, 2, 3, 4, 5 and 6, where the sign n represents a subunit and the sign \leftrightarrow is a relationship.

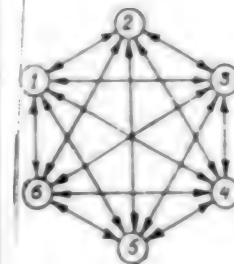


Figure 1.

It is evident from this diagram that the number of organizational and operational ties among the subunits that work within the apartment house is 15, but the number of such relations reaches 45 if all the 10 subunits employed on the job are taken into account.

Let us note an extremely significant factor: as the number of participants in construction increases, the number of interrelationships does not simply grow in direct proportion: for 6 participants there are 15, for 7 there are 21, while for 10 there are 45. It takes little thought to prove that, as a consequence of this phenomenon, the problems of managing construction work prove to be greatly complicated.

And it must also be considered that we are speaking here about one job. In real life the matter is not restricted to the erection of just one apartment house. And what, in reality, must be the number of interrelationships and interdependencies when this general contractor erects 15 different facilities during the year? And when for subcontractors the number of jobs reaches 30-40 per year on the average....

In examining the management problems, one cannot disregard either the difference of the partners' interests. The general contractor has a basic indicator--turnover of the job. The subcontractors, as everyone knows, have no responsibility for this. They are interested in the amount of work. And, at an apartment house, it is fairly meager--an average of 4.2 percent of the monthly program for specialized units.

It is not surprising that where the particular interests of the various participants are so complicated and, moreover, fraught with differences, there are now and then so-called "breakdowns" in the system for managing the work. That is, failures of the contemplated plan, now in one element, then in another. And the greater the number of economically separate construction participants, the greater the number of breakdowns. When there are too many of them, the management system loses entirely its capability for self-adjustment.

A completely natural question arises: what are the quantitative methods for determining just where this dangerous barrier, beyond which is a zone of unmanageability, lies? There is such a method. The capability of a production system to eliminate the consequences of the breakdowns is determined in quantitative terms by an indicator of the level of self-containment of a system, which is calculated as the ratio of the number of direct participants in construction that are not subordinated organizationally to each other to unity. It is more convenient to measure this indicator in percents.

For our example, the level of self-containment of the production system in executing the work inside the 70-unit building is equal to $1:6 \times 100 = 16.6$ percent.

The "indicator of reliability" of the function of the production system is interesting not just in and of itself. What is extraordinarily important is that it supplements considerably our concept of the level of effectiveness of specialization. For it is no secret that this work is often approached nonsystematically, and on the basis of scientifically substantiated computations, but professing faith in only one principle: specialization is good, and that means to press it single-mindedly to the end. But there are extremely grave errors from this.

It is not accidental that the not-so-favorable term, "specialized to excess," has now appeared in everyday speech. So it is that an optimum ratio between the two extremes--one and the same phenomenon--specialization and cooperation--should always be sought. A kink of any kind in these aspects is not at all inoffensive.

Let us turn now to this point of view that we shall now examine construction of the Tselintransstroy apartment house where SMP-638 was the general contractor. This subunit was doing all the general-construction work (including finishing). For all that, finished specialization was being observed here with precision.

Subunit 638 does the sanitary-plumbing and electrical-installing work, also with flyover specialization. Volstro-44 lays the outside water and sewer lines. Subunits Nos 1 and 2 are part of Tselintransstroy Trust. Subunits 3 and 4 are part of Gorkhilstroy Trust; Nos 5, 4, 5 and 8 are under different agencies. Work inside the building is performed by organizations Nos 1, 2, 3 and 4, work outside the building by organizations Nos 1, 2, 3, 4, 5, 6, 7 and 8.

What follows from the figures cited?

Let us depict graphically the relationships that arise in the performance of work inside the building (printed in boldface) (figure 2) (after recalling figure 1).

The number of interrelationships during the inside operations are 16, and the number of interrelationships for all other work is 38.

In comparing construction of the 75-unit and 70-unit apartment houses, we see essential organizational differences. The number of relationships for inside work is 3-fold less in the second case. The general contractor--SMP-638--coordinates the activities of only three subcontractors for work inside the building, versus five for the Gorkhilstroy SU. The total number of organizational and technical interrelationships among all participants in construction of the housing is 17 units fewer

(45 = 28). The level of self-containment in functioning of the production system inside the building is $1:4 \times 100 = 25$ percent, and for the whole facility it is $1:5 \times 100 = 20$ percent. SMP-638 does 81 percent of the work at the apartment house with its own funds, Gorkhilstroy SU 61.5 percent. Does this not account for the different final work results that are evident in table 1?

Moreover one looks, SMP-638's work indicators are higher than those of the Gorkhilstroy SU despite the fact that the latter is not carrying out labor-intensive operations at its facilities, unlike Tselintransstroy's builders.

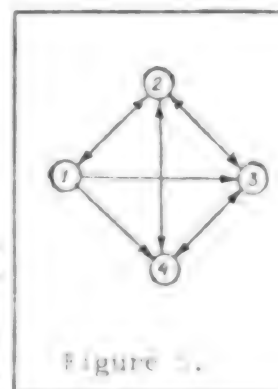


Figure 2.

Table 1

Line No.	Indicators	Units of measurement	Gorzhilstroy No	SMP-618
1.	Execution of construction and installing work under general contract.....	thousands of rubles	5,133	4,865
	By the unit's own forces.....	"	2,946	3,444
2.	Output per worker per year.....	"	12.6	11.8
3.	Average wage per worker for funds actually expended.....	rubles	218	201
4.	Balance-sheet profit on 1 Jan 79.....	thousands of rubles	140.8	197.7
5.	Housing introduced.....	thousands of m ²	22.9	23.3
6.	Evaluation of the facilities introduced:			
	Excellent.....	percent	--	14.2
	Good.....	"	60	85.7
	Satisfactory.....	"	40	--

Confirmation of the principle of self-containment of functioning of the system does not under any circumstance mean that one should refrain from specialization. On the contrary, any modern system should be specialized to the maximum, but exactly to the extent that it possesses, at the same time, maximum self-containment. It is precisely this dual-nature process that authoritatively requires today the creation of production associations, housing-construction combines (in cities) and rural construction combines. The questions being examined here acquire special urgency today, when questions of the utmost improvement of the economic mechanism and of a reduction in the number of levels of management have become the order of the day. For most frequently of all, the problem of the number of elements is examined along the "vertical," while ordinarily the "horizontal" is forgotten.

SMP-618 does not have, of course, as high a level of self-containment as a DSS housing-construction combine. However, it has one much higher than Gorzhilstroy No 603. And this, in our opinion, is one of the essential reasons for the more efficient and better quality of the work of Tselintransstroy Trust's subordinate.

Let us examine still another facet of the problem that is linked with the high efficiency of Tselinogradtyazhstroy Trust's work. It has already been noted that growth in the number of construction participants leads to the amount of information that circulates along the channels of these relationships being multiplied in a geometric progression. This is especially appreciable during the construction of facilities for housing, social and cultural purposes in the fourth quarter, when, according to ignoble tradition, almost half of the annual program construction is realized.

The formation of organizationally and economically separated general contractors, subcontractors and numerous clients and suppliers during this period engenders a great upward stream of information. Unfortunately, it is often very unobjective, for each participant strives to place the blame on interdependent entities.

Not being able to "recook" such an amount of information, the management services of the trust and the general contractor's economic units waste their efforts.

is getting themselves oriented currently to the situation. This concerns even concentrations of in-house forces at the jobs, not to mention effectiveness in coordination of the subcontractors' work.

The coefficient of useful utilization of resources in such situations drops sharply. An attempt is made to correct the situation in some degree through daily operational meetings of all the construction participants, directly at the facilities that are to be started up. But often this does not produce the proper results, since much of the time goes to hot disputes and mutual charges of general contractors, subcontractors, clients and suppliers and not to a search for ways to effectively and responsively the problems that are arising.

One can only regret that this multiple-level, organizationally dispersed, poorly effective system for managing the construction of facilities has been adopted in all the republics' Ministry of the Republics.

In conclusion, I would like to review certain possibilities for increasing the effectiveness of Yeltingradtyazhstroy Trust activity. It would be rash to call for a total breakdown of the forms of specialization that exist here, but certain revisions, in our view, should be introduced. This work is of special urgency in connection with the organization of associations in the branch. What is more, it would seem that in this case questions of the optimal relationship of the level of specialization and the possibilities for successful coordination of the action of construction participants should become the focus of attention.

A sharp increase in the number of specialized organizations would require also a drastic improvement in the management system. Ideally, to the extent possible, a number of specialized or construction operations could be combined in time. They are performed simultaneously. But a different picture is being observed here in practice still, which is obvious from a hypothetical elementary chart.

Sequence of the optimum work 1 _____ 2 _____ 1 _____ 3 _____ 1 _____ 4 _____ 1 _____ 5

Let us suppose that on some kind of a non-industrial job the general contractor (1) prepares a work front for Santekmontash No. (2) operations to install an air-conditioning system. After performing the work the sanitary technicians turn it over to the general contractor, who again presents a work front, now for Kazelekromontash No. (3) operations. The electrical installers, after hooking up the electric system and so on, also turn the work over to the general contractor, who accepts it and turns a work front over to the next subcontractor, the Kalmazhazhaytomatka section (4). The installed system of automotives is transferred to the general contractor, who, finally, transfers the whole conditioning system over to the client (5). It turns out that under the existing procedure each subcontractor turns his work over to the general contractor, who later turns it over to the next subcontractor, and so on. It is just such a procedure that has been formalized in the subcontractor agreements.

This type of mutual relations of the construction participants clearly has become obsolete. Today it will be more accurate to speak about a mutual granting of work fronts and not about the presentation thereof by the general contractor to each of the partners.

By changing the diagram shown above, another scheme of mutual actions of the construction participants can be presented. This one is more reasonable. The general contractor (1), after making the footings, presents the work front to Stal'montash [Steel-structure Erecting Administration] MO (2). The erectors, after assembling the building's framework (including the subtruss beams) opens up a work front for Kazpromtashmontash [Kazakh SOB Administration for the Installation of Industrial Equipment] MO (3). The installers, after installing an overhead-traveling bridge crane, gives its place to the Kazelektromontash MO (4). The electrical installers, after hooking up the electric motors and so on, presents a work front to the Kazmontashavtomatika section (5). The latter turns the tested crane over to the general contractor (1), and he turns it over to the client (6). This can be represented graphically, as shown in Figure 3.

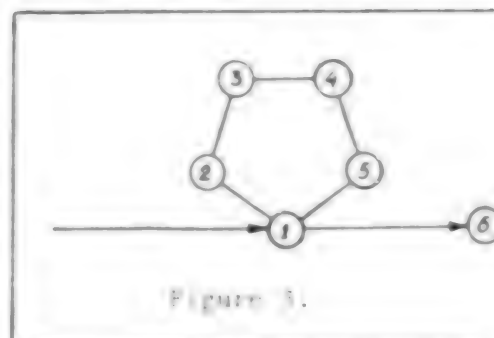


Figure 3.

The work in the previously cited example of installing air conditions should also be organized under approximately the same scheme.

If we consider that there are at each job tons of such structures and types of installing operations, then it becomes clear how much the new procedure will reduce the amount of uselessly circulating information and how much this will simplify the management process and will concretize the mutual relationships of construction participants.

In our view, subunits of the republic's Minmontashpetsstroy that are economically separate and under different agencies should be united in some way at each construction project, with a mission of creating a final product of its own kind. For example, 11 Minmontashpetsstroy subunits that are subordinated to various trusts and main administrations are functioning in Tselinograd.

The concept of joining these Minmontashpetsstroy subunits within the framework of the general regional borders of Tselinogradtyazhstroy Trust activity suggests itself. The association can have purely managerial organization-control functions with self-contained action of the specialized subunits. And another form, based upon an expansion of the rights, obligations and responsibility of a representative of Minmontashpetsstroy, which coordinates the activity of subcontracting organizations, obviously is also possible.

The fact that under such a scheme the general contractor does not have to conclude a contract with each of the Minmontashpetsstroy subcontractors is of basic importance. One contract will suffice, one that cites only the constructional structures that must be completed in order to open up a work front for the erecting and installing subcontractors.

Ahead from the realization of amounts of work, such an association of subcontracting organizations can and must plan the introduction of facilities. Under such an approach the coordination of specialized subunit activity will be sharply improved.

Something else also must be said, however. Specialization with Tselinogradtyazhstroy alone leaves much to be desired. The Otdelstroy administration, which does

coaching, planning, timing and juggling with, often does not help, but even have given the wrong examples of intervention in general administrative areas in presenting a myth that is distorting organisations. The fact is that the general philosophy of the 1970s (the word of the 1980's philosophy, which is at least as complicated as that of the 1970's) that of the controlling administration has, in general, been wrong. It is not that all the controlling administration has, in general, been wrong. It is that the controlling administration has, in general, been wrong.

By 1976, the *Journal of Military Administration* (JMA) in the United States had become one of the leading journals of literature published by the American military. For the quantitative and qualitative, for example, according to an analysis of the first quarter of 1978 the quantitative and qualitative were only 22% and 28% respectively according to the schedule. In 1978, if there was an article, it was not having a qualitative and quantitative administration. This question of "work" and "action" has been thought and asked at times. The conclusion of a book by the JMA is that it is not only a

On delivery of the structural steel frame and the quality of administration in the TC construction company and the construction company, the TC has enabled a number of benefits to be realized, with increases in the achievement of the following of the project and company, the effect, volume of construction capital (TC) company grows strongly, capital, technical and economic indicators are improved.

With growing use of the self-employment tax option, the degree of individualization in investment decisions in the operation of the joint project—family business, the more numerous. Additionally, experience and reliability in the program of Δ —competitive efforts, i.e., increased. Although the opportunity for business is not work satisfaction. And this will help directly to regulatory changes and to, in turn, the work itself. The self-employment tax option is not a panacea.

(3) Instead, we selected that the work effectiveness of special and additional employees is one of the output of the final product can be measured directly by means of the employees' work attitude.

© 1995 Cambridge University Press. Printed in the United Kingdom

times increase 10.4 to 12.8 hours. The level of dredge use exceeds 15 hours per day, but the pull is insufficient. Multiple-scoop excavators, lift trucks, single-scoop loaders, loader-scraper conveyor equipment and excavators with buckets up to 0.75 m³ are used most satisfactorily. Multiple-scoop excavators and lift cranes are operated continuously in one shift, inasmuch as the shifts are 8.2 hours long. At the same time, there is a realistic possibility of increasing the construction machinery employment shift index to 1.2 or two shifts per day, depending on type.

Analysis shows that the most important factors influencing level of machines and equipment use is the concentration and specialization of construction production and the conditions of shift combination.

Analysing capital investments among numerous construction sites and projects, the amount of work has practically remained the same, as a serious obstacle in the way of increasing of fixed production assets in construction. Along with the large number of concentrated construction projects, under the ministry's state plan alone about 10,000 to 120,000 production projects are built annually. As a result, an

For further basic theory, an average of 7-9 workers per constructing site were recommended in the 1985 Five-Year Plan.

When machines and equipment were used at each of them, leading to dispersion and low productivity. Moreover, time considerably is passed on the way to open construction sites, waiting for assembly, disassembly and performing these operations. The dissemination of machines to sites scattering and ensure the concentration of similar equipment will create conditions for concentrating construction equipment, increasing its maneuverability, reducing responsive expenditures and, in the end, further equipment use.

The specific "Methods Instructions" for setting actual construction machinery operating conditions and productivity were worked out in 1986. They are naturally obsolete, because in the ministry they appeared, technical-economic parameters for improving the durability and quality of the machinery, have become different in the inter-war period and other changes improving machinery operation have also occurred. But the most important thing is that the skill level of the workers has risen. Thus, the improvement was mainly via points during 1971-1973. This process continued in the 1985 Five-Year Plan. Consequently, measures for reducing recorded losses at each site and increasing the proportion of "net" time are available. It is essential to carry on to work the "Methods Instructions," increment with consideration of the above-stated factors.

The level of construction equipment use depends on the level of intrashift idle time, which is the integral part of shift working time. Selective surveys of construction stations of the ministry have shown that the proportion of intrashift losses of working time for basic machinery have remained significant for many years now. In the 1985 Five-Year Plan, the proportion was 15-18 percent of all shift working time, and in 1976-1979 -- 16 to 17.5 percent, whereas these losses were 18.3 percent in 1971. They were 18.3 percent in 1979. They are dominantly associated with idleness due to providing construction with materials, transport and proper organization.

The way of improving machinery equipment time use is to reduce the time they are lost on technical failures, to increase the time spent by repair or waiting for repair.

These indicators have significantly exceeded the normative for many years. In order to assess the extent of this idle time, let's look at their absolute values by individual type of machine in contractor construction (Table 1).

Table 1 (in millions of machine-hours)

	by year		
	1975	1977	1979
single-scoop excavators	3.22	3.56	3.87
bulldozers	3.96	4.42	4.54
scrappers	1.65	1.77	1.75
track-mounted cranes	2.32	2.42	1.07

The data show that the number of machine-hours spent waiting for repairs and having them done is very high. Their absolute values by year cannot fully describe the dynamics of relative growth in idle time, inasmuch as the machinery fleet also grew during that period. But the increase in the amount of construction equipment lagged somewhat behind the size of this idle time, that is, quite a definite tendency of the latter to increase was observed.

For example, equipment idle time in repair and waiting for repair exceeded normative time 1.5- to two-fold per average on establishment machine in 1976-1979. This situation is to be explained by a number of causes, foremost by serious shortcomings in the organization and technology of construction equipment servicing and the provision of spare parts. Construction ministries have not always had an adequate servicing base.

The machinery repair service in specialized organizations is still poorly organized. Equipment is often repaired under field conditions by the construction organizations themselves.

In recent years, the construction ministries have been set assignments on level of centralized machinery overhaul, that is, under factory conditions, but these assignments have generally not been met. The data of Table 2 testify to the proportion of such repair in total equipment repairs.

Table 2 (in percent)

	by year		
	1976	1977	1979
single-scoop excavators	55.1	58.5	62.6
bulldozers	61.8	66.0	66.2
crane-mounted cranes	68.9	66.3	64.8
minimatic-wheeled cranes	63.5	61.0	61.2

Thus, more than a third of these types of construction machines are overhauled outside specialized enterprises.

The low level of centralized repair and failure to meet the assignments set have led to a situation in which up to 45-50 percent of the planned volume of major overhaul has been done in operations organizations by nonmechanized individual methods or in workshops not suited to these purposes, for individual types of machines, which has significantly increased repair time and expenditures and has lowered repair quality. This has in turn led to unplanned equipment repairs.

Major overhauls on machines and machinery, and especially on ones of complicated design, must be done more in a centralized manner, at specialized enterprises, inasmuch as the high quality and economic expediency of such repairs are obvious.

This will enable us to reduce the time equipment spends in repair and waiting for repair to the normative level and, in the end, to significantly increase the number of machines which are operable. It could comprise 15-20 percent for individual machines.

The planned preventive equipment servicing and repair system instituted in 1978 anticipates planning and carrying out this work on the basis of recording machine output, rather than shift time. However, this system has been introduced slowly by construction organizations, although it is known that recording hours of machine output enables us to determine the actual time they are operable and, in so doing, ensures prompt servicing and repair. And this in turn means labor and materials expenditures on keeping the machinery fleet in operating condition will be reduced.

The level of wear of fixed production assets exerts a certain influence on the level and dynamics of return on capital. In 1975-1979, wear increased both for all fixed production assets and for construction-type assets.

A considerable number of machines whose service life has expired are being operated in construction. Their proportion of the total construction equipment fleet and the absolute numbers of them are increasing. Although the total construction machinery fleet is being supplemented annually through deliveries by industry, this does not make up for their physical withdrawal (wear).

The greatest proportion of worn-out equipment is among caterpillar-tractor, railroad and tower cranes, and the rate of increase in that proportion is also high among them. The level of wear is also significant for bulldozers, but it is dropping. True, the proportion of worn-out machines generally does not coincide with the dynamics of growth in the numbers of these machines and machinery, but the volume of deliveries and diversity in the structure of equipment being delivered to construction have an impact here.

The primary substantial effect on this process comes from machinebuilding industry's not fully meeting the demands of construction for machines and machinery. This impels construction workers to "overexpose" equipment, to overhaul it to keep it operable beyond the normative periods of physical wear. This is precisely the case with certain narrowly-specialized machines and machinery, as for example caterpillar-tractor and railroad cranes. There are also certain difficulties in providing construction with tower cranes.

The products list of machines being produced does not always correspond to modern demands and construction-installation production conditions, resulting, in a number of instances, in construction organizations' being forced to improve their designs. The higher demand for such equipment and narrowness of the production base delay the process of updating that equipment.

Along with negatively affecting return-on-capital indicators, all this leads to delaying not only scientific-technical progress in construction and introducing new methods of organizing construction production, but also the rates at which work is done and higher outlays on equipment maintenance and repair.

The quality of the machines and machinery being supplied construction is very important, but a check of their operating conditions shows that it has not always turned out to be satisfactory. For example, the 25-ton tower cranes produced by Nikopol'skiy Crane Plant imeni Lenin are supplied to construction with connecting subassemblies which do not fit, making normal initial assembly impossible. In a number of instances, cranes are shipped out in incomplete sets, without fasteners. This happens because control assembly is not done at the plant, and construction organizations are forced to eliminate defects at the construction site. The Odessa Plant imeni January Insurrection produces defective mobile hydraulic cranes with a power-driven telescoping boom on a special automobile-type chassis and other items.

The essential feature characterizing the available fleet of construction machines and machinery should also be noted. Thus, the rates of growth in the average power of the machines and machinery as calculated using a 1970 base index have lagged significantly behind the rates of growth in the available fleet of corresponding equipment, testifying to the significant place traditional, low-power models of construction equipment occupy in the machinery fleet.

This conclusion is supported by USSR Central Statistical Administration data which show that the number of highly productive machines in contractor organizations is still insignificant. In late 1978, 1.25 m³ or larger single-scoop excavators comprised only 5.5 percent of the total, and the bulk of these were concentrated in organizations of the USSR Ministry of Power and Electrification (21 percent) and Ministry of Transport Construction (18 percent). At that same time, the fleet of large (15-ton or larger) tower cranes numbered 755 units, or 2.2 percent of the total; pneumatic-wheel caterpillar cranes larger than 63 tons -- only 236 units, or 0.8 percent of the total (and 82 percent of these are concentrated in the USSR Ministry of Installation and Special Construction Work, USSR Ministry of Power and Electrification and Ministry of Transport Construction).

At present, the proportion of manual labor in construction is quite significant. This demands further intensification of the process of accumulating fixed production assets in the branch, as well as the replacement and write-off of obsolete and obsolescent assets. Consequently, construction must be equipped with fixed production assets at accelerated rates in the 11th Five-Year Plan as well, but this does not create objective prerequisites for increasing the return on capital in this particular period. At the same time, improving fixed production assets use remains a top-priority task.

Substantial factors in improving the return on capital (reducing capital intensiveness) include: improving the use of the entire aggregate of fixed construction production assets, including their most active part (machines and machinery, means of transport, machine tools and attachments), continuing to provide construction production with modern, more productive equipment which takes regional features into account.

A study of domestic and foreign experience shows that in order to substantially improve the effectiveness of job mechanization, we need to increase the average power of the basic machines being used in construction two- to three-fold, as well as to master the production of a number of new machines for the purposes of introducing new technological processes. Solving this problem will require the accelerated development of construction and road machinebuilding, raising the technical level of

the equipment being produced, improving the machine fleet structure, reducing losses of working time in the form of intrashift and whole-shift idle time, and increasing the shift index of machinery and equipment operation and their operating productivity.

It is important to improve the use of capacities of the existing repair base. It must be developed in accordance with the demands of the growing fleet of construction equipment and means of transport.

It is necessary to improve the quality of construction machine and machinery repair. This would be facilitated by steps to increase and improve use of existing mobile shops for the servicing and repair of construction machinery, by freeing mechanization administrations of the task of manufacturing spare and other parts themselves, and by introducing progressive equipment repair methods.

All this must ensure that priority is given to intensive factors of construction production growth. Improved construction equipment use will also be facilitated by steps to improve the management of its operation and repair. It is important that we be precisely oriented towards concentrating construction machines and machinery, as a rule, only in specialized organizations. The repair base must in the future be based and developed primarily on an interdepartmental basis. But it is expedient to concentrate the repair of complex construction equipment (excavators, dredges, scrapers, and so on) in ministries whose enterprises produce it. This would guarantee improving repair quality and reducing repair time, increasing the responsibility of producer plants for the quality of the output being produced.

The current "Basic Provisions" on the tasks and functions of the construction mechanization trusts (administrations) define the procedure for planning mechanization trust and administration activity, interrelationships with contractor construction-installation organizations, as well as calculations for the work done by them. Experience has shown that the "Basic Provisions" inadequately influence improving the effectiveness with which the available construction machinery fleet is used.

The established procedure is not always followed and not used everywhere. Calculations for work done by mechanization organizations are often made on the basis of the time the machines actually spend at the project. Moreover, the established procedure does not exclude the possibility of calculating for machine-shifts, rather than for work actually done.

The time construction equipment spends at the construction site obviously must be strictly regulated (by norms). Any "overexposure" of equipment at the site must be reflected in economic relations between general construction and mechanized organizations. In our view, sanctions against that party to blame for such keeping of construction machines and machinery beyond the established time must be fixed and actually used. But calculations between organizations must as a rule be made for actual amounts of work done.

In order to substantially improve the use of construction machines and machinery, we need to more closely link the system of incentives for mechanization trusts and administrations and for machine operators themselves with end results in construction, and foremost with the time needed to install projects and with their quality. It is also appropriate to review the work routines of machines and people involved in servicing them.

The efficient use of reserves for increasing the effectiveness of fixed production assets has a favorable influence on capital construction quality and the time involved in utilizing new production capacities.

CONSTRUCTION

ECONOMIST-DESIGNERS WANT BETTER, MORE COMPLETE BASELINE DATA FOR CONSTRUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 24, Jun 81 p 9

[Article by G. Shpykov, chief economist of Kaliningrazhdanproyekt [Kalinin Institute for the Design of Housing and Nonindustrial Facilities] (Kalinin): "From the Designers' Standpoint"]

[Text] An economist's reflections.

It is said that a construction project begins with design. This is a correct statement. The design lays down the basic economic and esthetic characteristics of the future facility, which determine, in the final analysis, the quality of the construction. And, moreover, a good design can serve as a standard for a whole city or settlement, and it will define, in the architects' expression, its silhouette and the comfort of the residents. And everything must be done on a par with the latest achievements of science and technology.

As was pointed out at the 26th Party Congress, high demands are being made on builders and designers during the 11th Five-Year Plan. Their job is to design and to build with high quality, effectively and rapidly, and to see to it that each facility is introduced into operation on the established deadline and is modern in all respects.

Kaliningrazhdanproyekt is assigned more than two-thirds of the design and budget-estimating documentation for housing and nonindustrial construction in the oblast's cities. During the entire preceding five-year plan the challenge Red Banner of Leningrad's designers did not leave our institute's walls. And it is here right now.

The collective has in recent years restructured its work to a great extent. And specifically, just how has this been expressed?

The system of planning and accounting and the material incentives for designers have been improved. Their work has been more fruitful since the startup of a computing center that is based on a third-generation computer, automatic draftsman and data plotter, and a number of new duplicating machines and the appearance of computer equipment for individual use. As a result, manual operations in developing designs and budget estimates have been sharply reduced.

An Important Examination

Based on the well-known decree of the party's Central Committee and the USSR Council of Ministers about improvement of the economic mechanism, our collective has done definite work on making choices among existing standard and repeatedly used designs and structure that are most economical. It has become possible to reduce construction costs somewhat and to provide for a saving of materials, primarily rolled steel, cement and lumber. A portion of the new architectural-layout and constructional solutions were worked out by the institute in collaboration with the Kalining Research and Demonstration Housing-Construction Combine and with the capital's leading scientific-research and design organizations.

The post of designer-economist has now been introduced into each of the institute's production studios. His responsibility is to analyze the economy of the solutions adopted, to find errors and to consider the effectiveness of the designs.

The work of Kaliningrazhdanproyekt is not devoid of deficiencies. We see them and we try to correct them. In particular, an integrated system for controlling the quality of design has been developed. And this brings positive results. There have been fewer reproaches about the quality of the designs, although clients still have complaints. Right now the quality-control system continues to be improved.

The institute's collective has everything that is needed for solving successfully the problems set before it. There is a well-equipped production base, experience in economic work has been gained, and there are enough skilled people.

During the five-year plan that has started, the designers, like all of Kaliningrad Oblast's builders, are taking an important examination. It must be confessed that it will not be easy. In 1981 it is planned to build 700,000 m² of new housing. Later the pace will increase. Right now the institute is issuing annually documentation for the erection of apartment houses that total 500,000-530,000 m² in area.

You do not survive by accumulated resources. It is necessary during design to seek out paths to reduce at construction projects the specific consumption of materials and labor and to cut the consumption of heat and fuel in the buildings, with a simultaneous rise in comfort in the apartments. There are reserves for this at our disposal, many of them. The main one is the introduction of scientific and technical achievements into designs. This means scientific-research and design-development work being linked more closely--economically and organically--with construction operations.

This year the institute is to complete the development of a new design for a 12-story panel-type building with improved layout, based upon items from the experimental and demonstration type housing-construction combine. The building will have more convenient apartments, and cement and steel consumption will be reduced during construction. We will continue to improve designs for boilerrooms and heating systems in apartment houses and also for purification structures.

Weakness in supervision of standard practices for introducing scientific and technical progress into housing and nonindustrial construction hampers us. Grazhdanproyekts [institutes for the design of housing and nonindustrial facilities] are in the position of stepchildren with RSFSR Gosstroy in this regard. Until now there

no precision and clarity about what should be included in the plan for new equipment and what is forbidden. This engenders complexity in formulating designs and numerous disputes between the institute and the higher organs that approve the plan. I would like to see RSFSR Gosstroy engage itself in earliest in this problem.

During the current five-year plan the role of economic methods for managing all construction operations and of improvement of the economic mechanism is growing. As is known, introduction of the planning of capital construction in accordance with the main indicator--finished construction commodity output--should be completed this year, as should the conversion to settlements based thereon.

This is a very important, complicated and responsible matter. The amount of construction will now be determined at the design stage in accordance with the budget-estimated cost. We will have to single out the startup complexes and phases in the design and make a complete computation of the requirements for materials and structure for the job as a whole. This is a long-time dream of the builders--that the construction project be provided with all that is necessary, not according to the "millionik"* but according to the detailed working drawings.

However, difficulties are arising here on the part of the designers of housing and of nonindustrial-type structures. I am not speaking about a large amount of additional operations. There are still much vagueness and many engineering complexities. The development and duplication of the necessary standards papers by scientific-research institutes lag behind today's requirements. Standard designs that we are to adapt to local construction conditions lack a listing of the requirements for materials and structure and an indication of the necessary GOST's [All-Union State Standards], brands and codes for accounting for them by computer.

That Which Depends upon Our Clients

High effectiveness and quality of designs depends to a great extent upon interdependent agencies--clients, local soviets, controllers of the utilities and services' networks--all those who issue baseline information for developing the documentation.

At times we are compelled to return orders precisely because of unsatisfactory baseline data. As a result, the design and construction of an apartment house or kindergarten is held up. On the other hand, the threat of nonfulfillment of the plan for survey and design work hangs over us. Thus, our institute recently received completely unsuitable baseline information for the design of three 75-unit apartment houses in the city of Bezhetsk.

Let us note: when an organization that lies within the system of local soviets is the client, almost everything is in order. But one has only to take a design for, let's say, housing for an industrial enterprise that is subordinate to some ministry or agency and a chain of discrepancies will appear. That is what happened in this case in Bezhetsk. In order to draw up a design and build two apartment houses, the plant was obligated to replace a part of the city's heating line, to build a large section of pipe of larger diameter, to lay a city water main entirely in another part of the city, and to do other work. And, in addition to

*[Translator's note: A standard assortment of building materials and items supplied to a construction project per million rubles' worth of construction work.]

everything else, the city soviet' ispolkom decided to place a women's prenatal clinic, economic and social organizations, an engineering and design office and an exhibition hall in the first stories of the new buildings. Yet the construction norms and regulations authorize only enterprises of strictly limited capacity for shopping, social dining, domestic services and communications (a postal section) to be placed on the first floors of apartment houses and the premises attached to them. The equipment of administrative premises is prohibited entirely.

The question of pulling down existing housing bothers us. In analyzing the baseline papers for design, we at once encounter cases where "healthy" houses with insignificant wear (30-50 percent) are subject to elimination.

Whole blocks and streets with 15-20 houses each sometimes are torn down. In Bezhetsk, again, for purposes of "site adaptation" for a 75-unit apartment-house and for development of the master plan, a decision was issued to tear down 19 houses in block No 10. We have great doubt about the correctness of this step.

Apparently, the quality of the design's baseline data, including the question about tearing down existing housing, needs deep and comprehensive review by USSR Gosstroy.

And there is more. The kalininskaya Oblast Ispolkom, on RSFSR Gosstroy's recommendation, approved a list of standard designs for apartment houses and social buildings for use in city construction during 1981-1985. However, among these designs are some that do not meet modern requirements for specific heat consumption during the winter. These indicators were higher than the control figures approved by USSR Gosstroydanstroy [State Committee for the Construction and Architecture of Housing and Nonindustrial Buildings].

For example, in the 85-series designs, which are most widely disseminated, specific heat consumption per square meter of computed area is much too great. This is a reserve for saving fuel, which both we, the designers and the workers of scientific-research and design institutes--the creators of standard designs, are required to use in earnest.

11409

USSR 1821/054

CONSTRUCTION

SUBSIDIARY PAPERS ISSUED BY CONSTRUCTION DESIGNERS CRITICIZED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 8 Jul 81 p 2

[Article by B. Kaplun, deputy section chief of Mosorgpromstroy [Industrial Construction Trust under the Moscow City Soviet]: "What Does the Little Guy Answer For?"]

[Text] In every joke there is always, as is well known, a grain of truth. At times it is an extremely tidy share. Thus we say ironically, "The little guy is always blamed." As they say, we all know the dodges of the one who loves to shift the blame. And if he actually is guilty?

words spoken by Comrade L. I. Brezhnev from the platform of the 26th Party Congress involuntarily come to mind: "Comrades, solution of the biggest and most complex tasks is within our powers. Yet it is a matter which, it would seem, is simple and very prosaic--a thrifty attitude toward social property, skill in making complete and desirable use of everything that we have, is becoming the core of our economic policy."

The logic of development of society is such that nowadays concepts that apparently are exclusively economic, such as, let's say, "effectiveness" and "quality," unexpectedly light up the back streets of the economic mechanism, where the economics enthusiasts rarely glance. But they ought to. Because the effectiveness of the economic mechanism and the reliability of economic relations depend upon the strength of each link of the system. For if some little link in the overall chain is not fashioned as it should be, it does not harden and the whole chain will break.

One such link in the construction assembly line is the design for organizing construction (POS). This is a document that not one construction project can get along without. As is said in an instruction approved by USSR Gosstroy, it is "basic for the distribution of capital investment and amounts of construction and installing work by construction period and for substantiation of the budget-estimated cost of construction." In working in the trust that is called upon to organize the construction of the capital's industrial facilities in a technologically competent manner, I have to consult daily POS's that have been prepared by various design institutes of the country. And the real quality of these documents at times certainly does not coincide strikingly with the demands made on them!

Take, for example, the design for rebuilding the Moscow Cardboard Printing Combine, which was drawn up by Gipropishcheprom [State Institute for the Design of

prom-Industry Enterprises]. Outwardly sound, the document causes nothing but vexation and perplexity because of the uselessly wasted worktime, and there is such a shortage of paper in our day. No one needs a collection of platitudes and useless information, if the most necessary things have been forgotten. At the very beginning of the explanatory note to the POS, reference listings (annotated lists) of the buildings to be constructed are given, but...without an indication of the substance, the number of stories, and the height of the facilities. Nowhere is it stated how much the various constructional members weigh. And there is no data from which one can determine how many workers are required at this construction site.

Whether or there is more. Data about the geological structure of the land section and the ground-water level are entirely lacking. The depth at which to lay the foundation remains an open question. It is not known whether the water table must be lowered, although the budget-estimated cost of construction depends directly upon this. This likewise is not shown in the POS. Nor are there breakdowns of capital investment by year of construction.

And that is not all. The explanatory note mentions casually that the builders have to work under the crowded conditions of an operating enterprise. This means that specific work-safety measures must be arranged. As a last resort, it should at least point out the procedure for erecting the framework and give substantiated solutions for organizing the erection site and the construction processes. Alas, there is none of this in the POS. The main place in the voluminous explanatory note is taken up with a description "in general and as a whole" of the methods for doing the construction and installing work. As if no one except the institute's staff surveyors were capable of holding a textbook on the technology of construction operations in his hands! As for the completely specific questions about erecting the complex at the given crowded construction site, this was passed by in silence.

In addition to the explanatory note, the POS includes a so-called master construction plan. Unfortunately, as with the notes, this plan has only an external resemblance to practical guidance over operations. The boundaries of the construction site have not been designated, danger zones have not been singled out, the necessary erecting mechanisms have not been named and their placement has not been pointed out, and data on the load-lifting capabilities and sweeps of the boom cranes have not been cited. And so on and so on. Today all these concerns are outside the designers' bailiwick. But then they rise up before the production workers, full-grown. And this is one of the serious factors that lead to growth in the budget-estimated cost and to an extension of construction deadlines.

Let me emphasize once more that we are not talking about an isolated case of a design defect. Were this work of Giproshcheprom an exception, it would not be worthwhile to take pen in hand to write about it. But the harm is that a formalistic attitude toward the development of designs for organizing construction has become nearly the norm. More than 100 of the country's design institutes prepare technical documentation to guide the work of Mayspromstroy [Main Administration for Industrial Construction of the Moscow City Soviet] subunits. The number of designs introduced each year also exceeds 100. It would seem that, given such a volume, it would be possible to find also positive examples. But somehow they do not come to mind. There is not a POS but what is at best a semifinished thing in need of serious refinement.

where to look for a way out of the situation that has been created? Many specialists, including those of our main administration, see as the basic solution of the problem the transfer of everyone connected with designing the technology and organization of construction to the contractor. A variant even has been discussed under which the contracting organizations would take upon themselves the preparation of detailed designs. In the opinion of the proponents of this scheme, this would enable the designers to study more carefully and intently the basic solutions at the preliminary design stage.

But any restructuring of the economic mechanism is a matter that is not simple and is expensive. Yet apartment houses and factories must be built today. They must be built rapidly and inexpensively and with high quality. So it would seem that the appropriate divisions of USSR Gosstroy should return to the question of manning design institutes with specialists skilled in the technology of performing operation and organizing construction work. Otherwise development of the POS's is left in the hands of the designers, but actually this does not make sense. Indeed, do you know how this abbreviation is deciphered unofficially in the engineers' circles? POS mean, "Let the little guy be responsible." That is correct, let him answer. But only for the job that has been entrusted to him.

11-109

18/1/84

CONSTRUCTION

BETTER PREPARATION, COORDINATION OF CONSTRUCTION DESIGNS URGED

MOSCOW EKONOMICHESKAYA GAZETA in Russian No 29, Jul 81 p 5

[Article by L. N. Dmitriyev, manager of the Construction Department of the CPSU Central Committee: "An Important Task for the Builders"]

[Text] As decided by the 26th Party Congress, capital investment through all financing sources is being increased 12-15 percent during the 11th Five-Year Plan. The goal will be 711-730 billion rubles, versus 634 billion rubles during the 10th and 495 billion rubles during the Ninth Five Year Plans.

This means providing for the growth in national income called for during the five-year plan (18-20 percent) with an absolute and relative growth in capital investment that is less than before. The new and higher goal is to be reached without an increase in construction-worker manpower and with a large saving of material resources.

"The new five-year plan will be a serious test for /construction workers /in bold-faced/.," Comrade L. I. Brezhnev noted in the report to the 26th CPSU Congress. "Its characteristic features are a concentration of forces in every possible way in the speediest possible completion and startup of those enterprises that are capable of providing for the greatest increase in output and breaking up bottlenecks. We have already taken this course, and it needs to be followed unflinchingly."

Realization of the party's and government's decisions about improving the economic mechanism will help to raise capital investment, speed up construction and improve its quality. The introduction of new methods of management has already exerted a beneficial influence on the intensification of construction work. For the national economy as a whole, the amount of uncompleted construction has been reduced by more than two points below the 1979 level. Manpower turnover at construction projects has been reduced. More than 80,000 brigades have begun to use the new form of contracting--the brigade contract.

The Economic Mechanism in Action

The greatest successes of the past 2 years were achieved where concern for realization of the CPSU Central Committee and USSR Council of Ministers decree of 12 July 1979 was applied deeply and creatively and with adherence to party principle. Builders of Belorussia, Uzbekistan, Azerbaijan, Bashkiria, Leningrad, Saratovskaya oblast and a number of other oblasts have intensified their attention to the

work conditions and the construction ministries still are poorly engaged in organizational work to implement the decisions adopted. The measures they have taken do not fully attract workers' collectives to the unconditional fulfillment of construction (immediate) output tasks and to insuring the timely introduction of production capacity and facilities into operation.

Improvement in the state of affairs at construction projects still is slow. About half the first half of the year were underfulfilled by many construction and installing organizations. The disposition of resources continues. The cost of construction often overflows significantly.

The Effectiveness and Reliability of Budget Estimates

Improvement in the level of planning construction that has been called for cannot be achieved without raising the quality of design developments and determining the accurate cost of facilities at the design stage. Checks of technical documentation by consultants' organs and by contracting ministry organizations indicate that the approved budget-estimated cost does not correspond in any sense with the actual cost. This violates the system of state planning and the balance of distribution of labor and material resources, and it leads to a failure to meet deadlines for introducing facilities into operation.

At some construction projects the reapproved budget-estimated cost greatly exceeds the original one, and construction time is stretched out. Thus, for the design of the third phase of the Cherepovets Industrial Tractor Plant, the cost of construction amounted to 1.5 billion rubles, versus the 2.2 million previously envisioned--it had increased almost 8-fold. Behind this fact were errors by Minsel'khozmasht (Ministry of Tractor and Agricultural Machine Building) in determining the estimated cost of the construction and repeated changes in design and the volume of tractor production. Glavgoskoperedika (Main Administration for State Consultant Review of Designs and Budget Estimates for Construction work) found in this design excessive areas for storage and auxiliary premises for a number of departments. The capacity of some industrial conversions proved to be underloaded by 30 percent.

It is not sufficient to recall again that, in accordance with the procedure introduced at the start of this year, the approved budget-estimated cost is the ceiling for the whole period of construction. The construction cost that is set in the design and budget-estimating documentation should correspond to the calculated cost or be lower than it. Each case of the slightest deviation from this requirement will be a party discussion in the collectives as a matter of principle. Cases of deviations in determining the authentic budget-estimated cost should be regarded as a most grave violation of state discipline.

When the question whose time has come, the desire of the party and the government for improving design and budget-estimating matters that was adopted at the start of this year will open up broad possibilities. Ways for further increasing the quality of designs and capital investment effectiveness were determined in it.

Simultaneously the responsibility of ministries, agencies and consultants' organs, research and design, design-development and scientific-research organizations, for economy [on high engineering and economic level] for design solutions and for correct determination of the budget-estimated cost of construction is being intensified. It

It is extremely important that USSR Gosplan determine, jointly with USSR Gosstroy, the accurate budget-estimated cost of construction prior to its inclusion in the plan. An unrealistic budget estimate is a serious interference in the development of balanced plans for construction. The budget estimate should be stable and economical.

It is pertinent that each individual case of deviation of design from the existing construction norms and regulations that is encountered is justified by "extraordinary necessity." However, if each is looked at more closely, such "corrections" bring hardly anything, in the final analysis, of use to the national economy.

In the near future, ministries and agencies and USSR Gosplan are to reevaluate the existing norms and regulations about design and to find reserves and surpluses that exist therein. The existence of a vast number of standards documents on construction by various ministries and agencies does not help matters. They are constantly being supplemented and refined and, at the same time, they are slow to reflect scientific and technical achievements and advanced experience. Common efforts must be made toward creating a single standards base in construction.

The task consists not only in direct savings, but also in achieving reduction of materials intensiveness and, on that basis, in reducing the prime production cost of the construction, based upon the use of effective building materials and structures and progressive three-dimensional layout and constructional solutions. The drive for savings at construction projects is by no means a short-term campaign but a long important management method at all stages and in all spheres of construction work. This was pointed out with new force in the CPSU Central Committee and USSR Council of Ministers decree, "On strengthening the work on Savings and Making Economies (on of Gas-Material, Fuel-and-Power and Other Material Resources)."

Improvement of Design Solutions

An example, represented in Glavzapstroy (Main Administration for Construction in the Moscow Economic Region) discovered great reserves for improving the quality of design and budget-estimating documentation and, as a result, for increasing the effect of costs of capital investment. This regional main administration of USSR Ministry of Building is located in Moscow Oblast.

At the initiative, the task of reconstructing construction and installing organizational measures for improving design solutions was intensified, with the approval of USSR Gosstroy. Glavzapstroy created an office of consultant review and improvement of design solutions. Under the terms of the experiment, it became possible for engineering organizations to introduce into working drawings, prior to their being reviewed as approved documentation, design changes that would reduce material and labor expenditures at construction projects. The design institutes should consider these recommendations.

In 1976 the valuable experience was adopted in fortifying the consultants' offices of Glavzapstroy (Main Administration for Housing and Nonindustrial Construction in the city of Moscow), Glavmashzapstroy (Main Administration for Construction in Moscow Oblast), Glavvostzapstroy (Main Administration for Construction in the Central Moscow Economic Region), Glavvostochnyapstroy (Main Administration for Construction in the Middle Volga Economic Region) and Leningradskiy. While they were active, they were given suggestions on 129 designs for saving 110 million rubles. This was 7.4 percent of the total budget-estimated cost, or 12.1 percent of the

cost of the construction and installing operations. Realization of the suggestions that were made will enable the builders' labor expenditure to be cut by 883,000 man-days.

In other words, the work that the small collectives of these offices (total manpower in 186) did was equivalent to the activity of two construction and installing associations with an annual program of more than 100 million rubles and a total manpower of 7,000-8,000. Yet they required no expenditures for materials or for the use of machines and mechanisms, and they saved energy resources.

The materials intensiveness of construction is being reduced considerably. The suggestions submitted will save 173,000 m³ of prefabricated and cast-in-place concrete, 12 million bricks and 25,000 tons of metal.

Many collectives of client organizations and design institutes, understanding correctly the tasks and purposes set for the experiment, held fast to the measures being conducted. In these cases appreciable results were obtained. Thus, thanks to the client ministries' timely adoption of effective suggestions, 240,000 rubles of above-plan profit were obtained by the contractor for a number of facilities for Trust No 32 of Glavzapstroy by reducing the costs of building the facilities. Materials consumption was reduced by almost 40 percent. The state received a real benefit. The actions of such clients as USSR Goskomsel'khoshtekhnika [State Committee for Supplying Production Equipment to Agriculture] and Mintyazhmash primarily deserve approval here.

Choice of Variant

Implementing the requirements of the decree about the economic mechanism in regard to developing variant design work, collectives of Glavzapstroy of USSR Minstroy, Glavpromstroyproyekt [Main Administration for the Design of Industrial Construction] of USSR Gosstroy and Stroybank's Leningrad Oblast Office conducted still another bold experiment. For some designs that were reworked by the institutes to take into account the suggestions of Glavzapstroy's Consultant's Office, a second additional variant of the design is being created that will reduce the cost of construction and installing work.

The first results obtained were encouraging. Thus, in accordance with the variant of design Institute No 1 of USSR Gosstroy, the cost of the administrative building for the machinery-repair base of the Fosforit Association was cut almost in half from the originally approved cost. Variants of designs of some engineering solutions that were made by Santekhproyekt [Sanitary-Engineering Design Institute] and TsNIIpromdizny [Central Scientific-Research and Experimental-Design Institute for Industrial Buildings and Structures] of USSR Gosstroy for the Vozrozhdeniye spinning and weaving factory in Leningrad are cutting the cost of these solutions 2-fold and more, and their realization will cut labor expenditure during construction more than 3-fold.

The USSR Ministry of Construction and its clients, bypassing agency barriers, must find a potential for realizing these solutions. It is very important that USSR Gosstroy determine in the given example the direction of development of the variant design work.

The builders' search for optimal variants is forcing design institutes to be more critical toward their developments, to intensify exactingness concerning the observance of norms and regulations during design work and to aim at a more detailed study of local conditions at construction sites. In so doing, as a rule, the capital-investment structure will be improved and an increase in the share of funds spent on equipment will be provided for.

Increasing the capacity of enterprises under construction through internal reserves in designs without actually increasing expenditures for the construction and installing work is of special interest. Thus, based upon contractors' suggestions, the capacity of the clothing factory of Leningrad's Tribune Association was increased 28 percent. Suggestions made to Mintyazhmash about the Association for Conveying and Elevating Equipment imeni S. M. Kirov were introduced. The capacity of the production facility being built there can be increased by 30 percent in the space that the previously approved design had specified.

The results achieved during the experiment to improve design solutions can be still more meaningful. Unfortunately, certain client ministries and design institutes, under various contrived pretexts, stretch out the review of the contractor's suggestions, adopt them unwillingly, or try at any price to refuse to rework the documentation. Yet the effectiveness of the measures depend to a great extent upon objective and responsive work by the services of the client and the designers. Time lost during review and coordination will at times reduce the suggestions themselves to naught. The contractor, in considering construction periods, is forced to return knowingly to irrational design solutions.

It is obvious that USSR Gosstroy and its partner organization must increase the vitality of Glavgosekspertiza services. The time has come for USSR Gosstroy to generalize the results of the experiments that have been conducted and, jointly with other interested organs, to convert the contracting organizations' work to reduce construction costs and to raise capital-investment effectiveness to a firm legal and organizational basis. The problem of incentives for such work by all construction-process participants must be solved.

The solution of these problems will enable the tasks of providing for the more complete conversion of construction operations to the rails of intensification that were set forth by the 26th Party Congress to be more implemented more rapidly and successfully.

11109

080: 1821/054

CONSTRUCTION

MODEL RURAL CONSTRUCTION, RENOVATION PROJECTS

Rural Experimental Construction

Moscow STROITEL'NAYA GAZETA in Russian 6 Jan 82 p 2

[Article by USSR Deputy Minister of Rural Construction A. Isayev: "System of Steps"]

[Text] In revealing and analyzing existing problems, the author correctly poses the question of the necessity of generalizing experience and further developing organizing the construction of rural experimental-demonstration settlements. After reviewing the materials published in STROITEL'NAYA GAZETA, the USSR Ministry of Rural Construction has been continuously monitoring such settlements. The results of work on meeting plans and assignments on building experimental-demonstration villages are reviewed at production conferences of the territorial construction administrations.

In order to put rural experimental-demonstration construction into proper order, it is necessary to:

1. Review the list of such settlements and leave on it only those population centers of interest from the viewpoint of conducting a comprehensive experiment in building up production and housing zones, checking the architectural and design resolutions of fully prefabricated housing, cultural and personal-services buildings and the use of industrial construction methods.

In our view, the experimental settlements should include only those which can be financed at levels ensuring completion of construction on all projects and of all work in 3-5 years.

2. Create a single-client service to build up experimental-demonstration settlements within zones, concentrating in them the funds for all clients financing construction of the projects.

3. Work out for each such settlement an experiment program and long-range construction plans indicating work volumes by year for the entire period, through completion.

Rural Renovation

Moscow STROITEL'NAYA GAZETA in Russian 15 Jan 82 p 2

[Interview with Gosgrazhdanstroy Chairman G. Fomin by O. Pakhomova, date and place not specified: "Rural Virgin Soil"]

[Text] Our correspondent spoke with Gosgrazhdanstroy Chairman G. Fomin about implementation of plans for the comprehensive transformation of the countryside and the results of the recently completed sixth stage of the unionwide contest-review for the best development and provision of rural population centers with public amenities.

[Question] Genadiy Nilovich, what are the features of the last stage in the review? How does it differ from preceding ones?

[Answer] First of all, in the number of competitors: about 2,000 settlements participated in this stage of the contest-review. Of the 400 rural population centers, one kolkhoz (all seven of its villages) and seven administrative regions selected by republic commissions, 312 were winners in the unionwide contest. By comparison, let me say that in 1967, for example, less than 200 works were submitted to juries for review in the first stage of the review. At that time, not one settlement received the highest award, the USSR Exhibit of National Economic Achievements certificate of honor, and they are now being awarded to 26 villages, two administrative regions and one kolkhoz.

The increased number of rural administrative regions meeting the strict requirements of the review, as compared with the preceding stage of the review, also indicates the rising level and growing scope of the transformation of the countryside. The winning regions -- Temryukskiy and Gul'kevichskiy rayons in Krasnodarskiy Kray, Tosnenskiy and Gorodetskiy rayons in Leningradskaya and Gor'kovskaya oblasts of the Nonchernozem Zone, Vinogradovskiy and Pokrovskiy rayons of Zakarpatskaya and Dnepropetrovskaya oblasts of the Ukraine -- are examples of comprehensive development and provision with public amenities on a large scale and with good work quality.

These achievements are a result of the planned, joint work of party, soviet and agricultural agencies, kolkhozes and sovkhoses, and collectives of architects, planners and builders in implementing the long-range programs of social and economic development.

[Question] And what characterizes the individual winning settlements?

[Answer] They are also distinguished foremost by comprehensiveness of development, the final goal being the creation of comfortable conditions for work and play. Modern production projects have been put up in these settlements in strict accord with approved general plans, housing and civil construction is done intensively, utilities systems have been developed and the provision of public amenities and landscaping is well done. The public centers of the Belorussian villages of Zashir'ye, Starchi, Bol'shiye Esmonty and Redkovichi, the Ukrainian villages of Vuzlove, Petrovka and Zarya, the Lithuanian villages of Al'sedzhyay and Lukne, Leningradskaya Station and the khutor [small village] of Boyko-Ponura in Krasnodarskiy Kray, Vinni and Medzhvriskevichi villages in Estonia and Georgia and other winners were done well and at a professional level. By grouping buildings and by carefully thinking through their layout, external and internal finishing, architects and builders have tried to integrate national traditions and modern architectural trends.

[Question] Can it be concluded from the review that comprehensive development has become the norm?

[Answer] In many union republics, as the Ukraine, Belorussia, Uzbekistan and several oblasts of the Russian Federation for example, that is the case. But for the country as a whole, we have still not reached that frontier. This is borne out, in particular, by the fact that the annual and five-year rural construction plans, especially for putting housing, children's preschool and school institutions into operation, are being met by far from all oblasts and republics. In general, there exists a very direct dependence between participation in the unionwide review and plan fulfillment -- in fact, completed settlements and settlement lines are submitted in the contest.

An example. It is known that things are far from going well in building up villages in a number of oblasts of the Russian Nonchernozem Zone. And the results of the last stage of the review confirm this: only 17 of 29 oblasts and ASSR's participated in the contest. Implementation of the decrees adopted by the CPSU Central Committee and USSR Council of Ministers on developing the RSFSR Nonchernozem and Chernozem zones facilitates developing agricultural production in these regions of the country and accelerates carrying out tasks on reconstructing villages and towns into kolkhoz and sovkhoz settlements provided with public amenities, as well as securing rural personnel. This means more settlements and entire rayons, such as Tosnenskiy and Gorodetskiy for example, will appear; they won high USSR Exhibit of National Economic Achievements awards for exemplary village reconstruction in Leningradskaya and Gor'kovskaya oblasts.

[Question] To judge from the materials of this contest-review, on the whole, what is the ratio of the volumes of work done by the contractor organizations and by the direct labor method?

[Answer] In general, the competing projects have not always been able to objectively reflect the ratio of contractor construction to direct labor either nationwide or in individual oblasts, krais, autonomous and union republics. These projects are in fact only representatives of numerous kolkhozes and sovkhozes. But the commission still did calculate that, and this is what it found. At this stage of the contest-review, the ratio of contractor to direct-labor construction in 170 winning sovkhoz villages was 49 to 51 percent, and in kolkhoz settlements -- 47 to 53 percent. Five years ago, these indicators were 35:65 and 30:70 percent, respectively.

The increasing activeness of contractor organizations in the 10th Five-Year Plan is to be explained by significant development of the material-technical base of rural and interkolkhoz construction organizations, as well as by the increased volume of housing and civil-construction work. The proportion of contractor construction is increasing year by year and preliminary estimates are that by 1990, its level will be at least two-thirds of the rural construction volume.

At the same time, the resolutions of the 26th Party Congress anticipate improving the direct labor method as well, which will permit the more extensive use of local material-technical and labor resources of the farms.

[Question] Genadiy Nilovich, this past five-year plan and the sixth stage of the review were also distinguished qualitatively by the fact that a course was adopted of installing farmstead housing and farm structures to run private subsidiary farms which, as is known, more fully meet the interests of the rural population. How much has the proportion of such homes increases?

[Answer] In 1980, single-family farmstead housing comprised 55 percent of all state rural construction. We should add to this another 20 percent of two-story two- and four-apartment houses with farm structures and subsidiary plots. The construction of three- and five-story multiple-apartment sectional houses has been significantly reduced and is being done in isolated instances in settlement centers and when building large industrial complexes.

[Question] But still, quite a few city-type buildings are being put up. Rural house-building combines are especially "guilty" of this.

[Answer] During the 11th Five-Year Plan, as rural construction combines are changed over to producing farmstead houses and as the new SDSK's [not further identified] are introduced to produce cottages, as the bases of contractor organizations are retooled, the proportion of farmstead houses in total state rural construction will increase even more. And the houses will basically have improved layouts, greater comfort and the necessary farm structures.

[Question] Yes, but this will probably require additional funds.

[Answer] Of course, it costs more to put up one- and two-story farmstead houses than sectional ones. In connection with the increased proportion of farmstead houses in overall construction volume, as well as with the construction of farm structures, the average cost of building one square meter of total housing area has increased significantly. Thus, it was 186.6 rubles in 1975 and was 198.5 rubles by 1980. According to USSR Gosplan and Gosstroy calculations, by the end of the current five-year plan, the cost of rural housing will have increased another 11.3 percent due to this increased comfort. Our party and state have embarked on this in an effort to bring the standards of living of rural and urban workers closer to one another, to ensure the securing of rural personnel.

In accordance with the resolutions of the 26th CPSU Congress and the five-year plan adopted by the 6th USSR Supreme Soviet Session, rural housing starts in the 11th Five-Year Plan will have increased by 30 million square meters in comparison with the preceding five-year plan. All this will require a significant improvement in the efficiency of operation of the construction conveyor and seeking out means of and reserves for lowering the cost of housing being built. We first of all need to reject the construction of houses exceeding existing normatives in terms of space and expenditures of materials and to use the most economical types of farm outbuildings. We need to introduce standard housing plans using cheap local materials more extensively, to build more buildings out of cellular concrete, which has better technical and economic indicators than brick houses.

The development of individual cooperative rural construction is a significant reserve for saving state funds. Much housing is being put up by enlisting the funds of individuals in the Baltic states, Uzbekistan, Moscow Oblast, Belorussia and the Ukraine. Last year alone, members of the country's rural ZhSK's [housing construction cooperatives] received 234,000 square meters of total space. The recently adopted CPSU Central Committee and USSR Council of Minister Decree "On Individual Housing Construction" anticipates additional privileges for rural laborers building their own homes. The state and kolkhozes will be able to use the funds thus freed to build cultural and personal-services projects, children's institutions, utilities and public amenities and, in so doing, complete the comprehensive development of settlements faster.

[Question] Incidentally, the contest-review showed the many benefits provided by using economical types of public building plans.

[Answer] Yes, and this five-year plan we will develop the construction of cooperative and modular public buildings on the basis of standard documentation; as compared with ones built individually, they are 14-17 percent more economical to build and operate.

The experience of Leningradskaya Station and Kanevskaya Station in Temryukskiy Rayon, Krasnodarskiy Kray, as well as Pokrovskiy Rayon in Dnepropetrovskaya Oblast, which have created consolidated central farmsteads, also merits dissemination. They have built cultural and personal-services projects, done landscaping, put in public amenities and laid utilities there by consolidating the funds of several farms. Quite a bit of money was thus saved by eliminating duplication in building Palaces of Culture, trade centers and other facilities in each population center.

[Question] And in conclusion, Genadiy Nilovich, a few words about changing the procedure for conducting the next stage in the unionwide contest-review.

[Answer] The results of the seventh stage will be summed up in 1986. The longer interval, now five instead of three years, will, we think, permit a better substantiated evaluation of the changes which have occurred in comprehensive transformation of the countryside in accordance with fulfillment of economic and social development plans of the farms and administrative regions. In this connection, the work on altering the terms of the contest will soon be complete. When summing up its results and determining the winners, consideration will now be given to how effectively capital investments have been used, to how much the cost of construction, labor expenditures, and expenditures of metal, cement, fuel and energy resources have been reduced. Higher demands will be made on organizing rural housing and production zones, on the architectural and artistic expressiveness of the public center and to the general plans developed.

Broadening the scope of the contest-review and increasing the demands made on its participants will, we think, facilitate carrying out the large socioeconomic tasks of transforming the countryside as set us by the 26th Party Congress.

11052

CSO: 1821/078

CONSTRUCTION

NOVOSIBIRSK BUILDING UNIT REORGANIZES TO MANAGE RESOURCES BETTER

Moscow EKONOMICHESKAYA GAZETA in Russian No 20, May 81 (signed to press 11 May 81)
p 7

[Article by V. Sharapov, chief of the Economic Planning Administration of Glavnovosibirskstroy: "For a Three-Level System"]

[Text] For several years Glavnovosibirskstroy [Main Administration for Construction in Novosibirskaya Oblast] has been making studies of a more optimal structure of management for construction work. This main administration includes 11 general-construction prime-contracting and three specialized subcontracting trusts. Motor-vehicle transport is concentrated in Novosibirskstroytrans [Trust for Motor-Vehicle Transport for Construction Work in Novosibirskaya Oblast]. The production base consists of 16 industrial enterprises that produce reinforced-concrete structure and other building materials. Nine of them are united in Zhelezobeton [Trust for the Production of Concrete and Reinforced-Concrete Products]. The main portion of the construction machinery and mechanisms has been concentrated in the Stroymekhanizatsiya and Spetsstroy trusts. Our organizations and enterprises are supplied with equipment through Novosibirskstroykomplekt [Administration for Supplying Novosibirskaya Oblast Construction Projects with Complete Sets of Equipment].

The Statute on the Socialist State Production Enterprise has been applied to all trusts. But their construction administrations, on the contrary, do not possess such rights.

Therefore, it is the trust that concludes the contracts with clients, subcontracting organizations and suppliers, effects mutual relationships with the budget, and makes deduction for economic incentive funds. Thus the construction administration (SU) acts on the principles of intratrust cost-accounting.

This has guided further improvement in the construction organization structure in Glavnovosibirskstroy. We decided to centralize SU functions for planning, accounting and reporting, financing, and budget-estimating and contract work in the trusts. We have been supported by USSR Minstroy [Ministry of Construction], which has ordered transfer of the SU's of four trusts to intratrust cost-accounting. Since October 1980 the accounts of these SU's have been closed in banking institutions.

I will note that there has already been definite experience in the main administration. Novosibirskzhilstroy-1 [Novosibirsk Housing-Construction Trust No 1] has been working under such a system since 1976, Novosibirskelektrodstroy since 1978. Both Novosibirskpromstroy [Novosibirsk Trust for the Construction of Industrial

Enterprises] and Berdskpromstroy [Berdsk Trust for the Construction of Industrial Enterprises] are operating without independent subunits.

Experience in their economic activity confirms that concentration of the enumerated functions in the trust helps to strengthen monitoring of subunit activity and to enhance the potential for flexibility in the use of resources. SU supervisors, having been freed of the need to solve some economic problems, are paying main attention to organizing production. The responsibility of line engineers and technicians, who report within the trust directly to the centralized services, is raised.

Also, restructuring has enabled conversion to a three-level system of management: trust-regional main administration-USSR Minstroy.

It should be noted that the administration, as practice indicates, is complicated by the abundance of brigades with few people. Right now the brigades in main administration organs number 550, with an average of 13 people each, there being barely 10 workers in 132 brigades (24 percent of the total).

Brigades with few people are not in a position to assure the final results of construction operations.

Also, all our attempts to consolidate existing brigades still run into the dispersion of capital investment. The number of facilities being built simultaneously is large. Resources are being split up willy-nilly.

At the start of the year the main administration had undertaken the erection of 1,078 bldg. Why so many? Because the approved plan for contract work calls each year for the construction of facilities for a greater number of grant-receiving enterprises, with programs of 100,000 to several millions of rubles. They make up more than half the total.

As a result, no concentration is achieved. For the builders do not have the right to choose which client they will build for and which they will refuse. We are obligated to provide for fulfillment of the approved plan for the whole list of clients.

After the conversion last year to the evaluation of activity in accordance with construction commodity output, our main administration, together with Stroybank's main office, undertook the function of making a preliminary review of the clients' lists of titles of construction projects. This enables the number of newly started jobs to be reduced in some measure. But we do not have the last word. The client enterprises and our USSR Minstroy, as well as the planning organs, must hold the decisive position on this question.

Stroybank, in its turn, is persistently seeking ways to concentrate resources. We are trying to consolidate lower-level construction elements as much as possible.

The following scheme is taken as a reference point. The superintendent should have 25 men each under him. The section chief (senior superintendent) should have 4 brigades. We hope in this way to release a large number of line specialists and to simplify the management and servicing of the brigades.

1974
100 (8) 1051

CONSTRUCTION

WORK OF ECONOMIC SERVICES OF SOME KOMI CONSTRUCTION UNITS NOT REALISTIC

NEKHOLOV EKONOMICHESKAYA GAZETA in Russian No 21, May 81 p 7

[Article by N. Subbotin, candidate of economic sciences (Syktyvkar): "What's Behind the Figure in the Report"]

[Text] As the economic mechanism is being improved in construction, the role of the economic services of contracting organizations grows. Are all of them ready to meet new and ever-higher demands?

Unfortunately, an acquaintanceship with economic work at Komityazhstroy [Association for Construction of Heavy Industry Enterprises in the Komi ASSR] and Glavkomi-gazneftstroy [Main Administration for Construction of Gas and Oil Industry Enterprises in the Komi ASSR] construction projects indicates that there are serious omissions. An integrated approach to evaluation of achieved results is lacking here. A deep and comprehensive economic analysis has not become the everyday rule. It is because of this that the discovery both of advanced experience and of deficiencies and reserves is delayed.

In Komityazhstroy and the Promstroy [Industrial Construction Trust] of Glavkomi-gazneftstroy the practice of planning expenditures for contracting brigades that are below the actual expenditures has taken root. For example, expenditures for materials, as a rule, overstated, while under the heading, "Expenditures for the operation of Machinery and Mechanisms," they are, on the contrary, understated 1.5- to 2-fold. Plan expenditures for certain other headings also are not being properly substantiated.

While planning the prime operating costs for the cost-accounting brigade, section or construction administration as a whole, for some reason or other it is customary here to be oriented to the totals of the budget-estimated expenditures by heading. For this purpose, the planners, economists and budget estimators make calculations in accordance with zonal catalogs and collections of unit costings that are in no way limited for all items of the budget estimates and sets of operations. Then all "migrate" into the plans of the production collectives, even though there are no solid grounds for them.

The expenditures thus computed do not correspond to the specific conditions that are emerging. This is easy to explain. In the first place the budget-estimated expenditures are averaged for price-setting purposes. In the second place, they reflect those achievements of science and technology that were the norms when they

were compiled, which was 20 years ago. Nowadays, methods and processes for doing the work, machines, tooling and tools, and new materials and technology are being used that differ radically from those that existed at that time.

Increased computational work, which takes up about one-third of the specialists' worktime, is being done to gather this useless information. Meanwhile, all the data necessary for the plans for preparation for production and for the PPR's (work plans), as well as for the orders that are compiled for each brigade for wages, already exist. Using them, it is possible to obtain information simply about the actual expenditures for all headings, classes, types and purposes.

As a rule, the cause of such gross errors in economic planning is noncoordination of the actions of the service and sections of trust and administration staffs.

Let us add that many errors are also being committed in the accounting for actual expenditures. As a result, it is completely impossible to analyze the results in detail and to evaluate the work of a section or brigade objectively. For example, it is known that the operations of machines and mechanisms are performed for the main production and auxiliary processes. The latter include the unloading and loading of materials and structure that arrive at the construction site. With regard to planes, these processes take up as much as 12-14 percent of the worktime. These expenditures should be charged to the cost of the materials. But this breakdown in the reporting of expenditures is not being made in *Stroiyazhstroy* and *Truststroy*.

All the machine-shifts are recorded as expenditures for basic production, and they are overstated considerably. Mistakes are not limited to this. Since the cost of the materials consumed is computed at plan prices with delivery to the construction site (at prices from the construction site, or T.O.B. the job storage site), a great part of the expenditures for mechanisms proves to be calculated twice: in the cost of the materials, and under the heading, "Expenditures for the Operation of Machines and Mechanisms."

We observe a similar practice in the distribution of labor expenditures and the work time. Auxiliary processes are not broken down in job orders. Therefore, pay that is chargeable to expenditures for the procurement and delivery to the site of materials, parts and structure falls under basic production, under the heading, "Main wages." And, what is more, these expenditures are counted in the planned accounting price for the materials.

As for the analytical work, it is difficult to overestimate the value of information that is contained in the annual reports of SMO's (construction and installing administrations) and trusts. Explanatory notes are appended so that each aspect of the planning operations may be investigated, so that everything will be broken down, as they say, by shelf. Then analysis will enable ways to improve operations to be found. In so doing, the experience not only of one's own advanced workers but also of those of other construction projects that is applicable under the given conditions must be generalized. It is very important to detect bottlenecks, deficiencies and reserves fully, and also their causes.

As for the *Stroiyazhstroy* and *Glavkomigazneftstroy* SMO's and trusts (with the slightest exceptions), mainly, they

duplicate the data of the reporting forms. Consequently, economists and planners do not use the time in the discovery and evaluation of reserves.

Here is a typical example. According to the annual report of the Promstroy Trust and Ministry of Oil and previously mentioned, an increase of more than 2 million rubles in expenditures for materials was explained by "factor." It was noted that 100,000 rubles were for procurement and storage expenditures for the main administration's supply and marketing organizations and about 700,000 for an excess of prices for the shipment of materials and structure above the budget-estimated cost. But for what materials and articles, at which facilities, and by which shipper did this occur? What must be done to eliminate such losses? None of the trust's supervisors were in a position to answer these questions. Consequently, only an imitation of analysis had been made. An arbitrary rearranging of the figures, and that is all.

To be convinced of this, compare Promstroy's report for the year with similar data of other Glavkomigazneftestroy trusts that are working under the same conditions. For Promstroy Trust, an overstating of the plan norm for procurement and storage expenditures supposedly caused an increase in costs of more than 10 kopecks for each ruble of materials expended. In other trusts of this main administration only a 10% was entered in the given column, or a hundredth of a kopeck. As we see, the disagreement is substantial, and supply is effected by those same suppliers and in accordance with the same norms. Promstroy wrote off 8 kopecks per ruble of expended materials for an excess in prices for shipment, while other trusts recorded 0.1 at the 0.5-1 kopeck level.

The source of this is concealed in the lackadaisical approach to study and evaluation of the activity of construction administrations subordinate to Promstroy Trust. There is little from this analysis that is useful for the business.

It is important to remind komit'yazhstroy and Glavkomigazneftestroy supervisors that without a deep and integrated study and analysis, the results of the activity of the economic bodies involved in production operations--brigades, sections and construction administrations--cannot be analyzed correctly. And if errors in evaluating results are permitted, then inevitably the principles of moral and material incentives are undermined.

At present, analysis is a powerful means for discovering available reserves, with which we will not simply obtain information for reflection, we will also plan better our operations. The realism of plans depends directly upon the objectivity of the analysis.

1948
Nov. 20, 1951

ARCHITECTURAL PROGRESS IN THREE MIDDLE OB' REGION CITIES DESCRIBED

СОВЕТСКОЕ АРХИТЕКТУРА СССР In Russian No. 3, 1980 (signed to press 12 Jan 80) pp. 48-50

(Article by Architect A. Antonov: "Cities of the Middle Ob'")

(Title) "The Soviet people are successfully realizing the gigantic integrated project for creating a fuel and power base in the oil and gas bearing regions of Tyumen's Oblast."

The communities of this vast region that are being developed and built up most intensively are cities of the Middle Ob' region--Surgut, Nizhnevartovsk and Nefteyugansk. Geographicheskoy Intate Committee for the Construction of Housing and Non-industrial Buildings designated top level institutes--Leningrad Zonal Scientific-Research and Design Institute for standard and experimental design of housing and social buildings, Siberian Zonal Scientific-Research and Design Institute for standard and experimental design of housing and social buildings and Leningrad Scientific-Research and Design Institute for urban development--to provide design and budget-estimating documentation in timely fashion for the construction and to extend creative assistance in the shaping of the architectural and layout aspects of, respectively, Surgut, Nizhnevartovsk and Nefteyugansk.

A well-appointed housing inventory will be constructed in Surgut, Nefteyugansk and Nizhnevartovsk in the next 5 years, including 1980, that will equal the buildup of the preceding 10-15 years. Hundreds of buildings for kindergartens, schools, offices, enterprises for social eating, shopping and personal-amenity services, health, hospitals, sports structures and so on will be built.

The Middle Ob' cities have different land-use conditions and their construction began at different times. Therefore, Geographicheskoy approached their design and construction with different organizational, creative and urban-development criteria.

It is desirable to compare the development and buildup of these cities.

The modern status of Surgut, Nizhnevartovsk and Nefteyugansk is marked by a lack of correspondence of the approved master plans with the size of today's populations. More than three times as many people are living in Nefteyugansk today as the master plan called for in 1956. According to 1978 data, the population for Nizhnevartovsk and Surgut in the long term will be 3-fold and 5-fold more than set forth in the master plans. This will lead to a lag in development of these cities' construction equipment and systems of services.

Surgut at present consists of settlements of oilfield, power-engineering and construction workers that were built up with permanent-type well-appointed buildings, but they were not developed into a single urban organism. The complexes of housing and social buildings that have been formed evince a definite scale which was dictated by the three-dimensional and flexible solution of the architecture of K-151-017-series apartment houses and some social buildings, as well as by the existing masses of natural greenery. Only in the oilfield workers' blocks are there two short streets that have been developed and furnished with civic improvements.

A primary task is development of the center and improved streets and waterfront facilities, which will permit the creation of a full-fledged city made up of separated settlements. The architectural ensembles that are being shaped by the squares of the House for Oilfield-Equipment Workers and the House of the Soviets and the picturesque valleys of the Tayna and Sordakovka rivers and adjacent sections of the Tayna forest can serve as confirmation of this. The directions of further development of the city, taking into account the prospective growth of its population, must be defined.

LenZNIIEP has created in Surgut a design branch at which more than 250 specialists are working. The LenZNIIEP branch provides the construction project with design documentation, but the influence of the institute's main production facility, which has highly qualified architects, should improve formulation of the layout and building in Surgut.

Yuzovskaya has a number of deficiencies in layout and a prosaic buildup. The correct scale for Prospekt Lenina, Ulitsa Kossomarov and the microzones that surround the center have not been found. Scarcely one of the microzones has been completed by construction, and the social center is not being built. Small architectural shapes for the children's squares are clumsy and uninteresting, and there are no other small architectural shapes in the city. The lack of a proper maintenance service leads to tasteless painting and the destruction of facades. The lack of maintenance has led to emergency conditions for some buildings, and also for roads and sidewalks. It is precisely these--the absence of any kind of civic improvements that have been brought up to a definite architectural and artistic level and a lack of some sections of the buildup, the lack of concern about forming a full-fledged urban environment--that reduces the general impression of the city's development. Unfortunately, various architectural errors also have been committed. For example, on the waterfront, along with a motion-picture theater that was built with types of axial solution, a dancehall-cafe is being built whose main facade has a purely axial solution, despite the fact that it stands at an angle to the waterfront and is a most important urban arterial--Prospekt Lenina.

Kommunist has a clear-cut but somewhat "dryish" layout and development. The buildings of the House of the Soviets, the Yuganskneftegas Administration and the main building of the central square do not create an interesting architectural ensemble. The second wing of the building has been completed. The city is distinguished from other settlements by well-executed civic improvements and careful maintenance, and also by a definite artistic level in the shaping of the ends of the residential and by the interesting artistic solution of the hotel interiors.

A most important problem in developing the city is the regional distribution of new construction. Work on the design and execution of hydraulic fill of land on the upper reaches of the floodplain must be implemented quickly. Only this work will require

5-6 years, so the only way out is to tear down two-story wooden housing. The new construction in these areas should be performed with a sharp concentration of the buildup and an increased number of stories.

The group of workers' design and designers' surveillance, the establishment of which was decided by the LenNIIPgradostroitel'stva management, will help to improve the quality of the buildup.

The main base for industrialized housing construction in the oil and gas bearing regions is the Surgut Housing Construction Combine, which has a construction volume of more than 350,000 m² of total area per year. The Surgut DSK [Housing Construction Combine] sends housing to a number of communities of the Middle and Northern Ob' regions, in addition to the indicated cities. A major deficiency in the DSK's work is the fact that it produces, in addition to apartment houses of the progressive M-164-07 series, with comfortable apartments, which take the natural and climatic conditions of the Middle Ob' region into account, a large amount of housing of the obsolete I-467 series. The production of items for two series by one DSK reduces its work effectiveness and causes complexity in making up complete sets of items and in the installing work. Therefore, it is suggested that the Surgut DSK be rebuilt and expanded to bring its capacity up to 500,000 m² of total area per year over a broad products mix for 5-story and 9-story sectional units and apartment houses of just the one M-164-07 series, and also mastery of the production of MM-04 series items for the erection of social buildings. It is planned to introduce a DSK into operation at Nizhnevartovsk.

Surgut, Nizhnevartovsk and Nefteyugansk are base cities. This means that geologists, oil-recovery workers, drillers and builders live there and ride to rotating-duty work, to the place of application of their labor, for tens or even hundreds of kilometers. Right now there are more than 120 rotating-duty type settlements in the Middle Ob'. Apparently the time has come to view the base cities and the rotating-duty type settlements as a unified system with regard to the technical level of design, construction and financing. Meanwhile, while today it has become axiomatic to build well-appointed permanent-type housing and social buildings in base cities, the rotating-duty type settlements basically are made up of mobile housing or temporary wooden huts without amenities.

The economic workers consider it possible to approach the construction of rotating-duty settlements from the obsolete and questionable point of view--"only a roof over one's head." It has been proven, at the same time, that additional expenditures for the erection of rotating-duty settlements in accordance with special designs pay for themselves, thanks to a reduction in departures of personnel. LenNIIP has worked out designs for integrated buildings for rotating-duty settlements, made of both prefabricated reinforced-concrete structure produced by the Surgut DSK and lightweight aluminum structure. But in the Surgut, Nizhnevartovsk and Nefteyugansk areas the rotating-duty settlements are not being built in accordance with special designs. It seems to us that this type of settlement should be erected under a system that is unified with the base city in regard to engineering, qualitative and social level.

Middle Ob' cities need the construction of experimental research type buildings that correspond to the natural and climatic conditions and to the peculiarity of the order of things and personal services amenities. In the year that the new SNiP II-L.1-71 came out, M-164-07 series apartment houses began to be erected here in

accordance with northern norms. The apartments of these buildings have a total area 10 percent greater than the area of apartments in the central zone, drying closets for work clothes and footwear, zoning in multiple-room apartments, and triple glazing of window openings. There is space for perambulators, sleds and so on in the staircase vestibules in apartment houses where the stories are 3 meters in height.

The design of a school building for 1,176 pupils that was developed for microrayon A in Surgut is of definite interest. The school consists of four buildings with a precise distribution of premises for young and older students and for the activities of extended-day school groups, and also a developed sports complex with a large sports hall and swimming pool. The isolated location of the sports complex will enable its use in the evening hours by all residents of the microrayon. An integrated three-dimensional spatial combining of the school buildings was adopted so this, the largest social building, would contrast in shape and sculpting with the rectangular volume of the apartment houses.

In a northern climate, a striving toward a colorful solution to development that includes elements of the decorative graphic arts is understandable.

In speaking here, previously about a synthesis of graphic arts and architecture, some examples of good solutions can be cited.

In Nefteyugansk the student body of the Nosovskiy Artists' School and professional artists were called in to execute the mosaic panels at the ends of the buildings. The panels at the end of an apartment house on the boulevard and on the building of the Palace of Culture for Construction Workers are of definite interest. Elements of decor of the social premises and hotel restaurant were carried out with good artistic taste. In Surgut the student body of the L'vov Artists' Institute made a number of interesting small architectural shapes and a decorative wall for the entrance to the park. But the decorative panels at kindergarten-nurseries in Nizhnevartovsk were done uninterestingly and unprofessionally. The enormous reinforced-concrete awnings on sections of the kindergarten-nurseries reflect clumsiness and a lack of taste in painting.

Architects must pay attention in approaching this most important problem of the environment and aim their efforts at the path of a synthesis of the graphic arts with architecture.

In the Middle Ob' environment this problem acquires special severity because of the very short frostfree period. Its solution is hampered by the lack of standard designs for small architectural shapes and elements of civic improvements that consider the specific climatic conditions. LenZNIIEP and the Kuybyshev Division, in developing the industrial designs for housing-construction enterprises, did not call for production lines therein for the manufacture of civic-improvement elements.

The municipal-services industries zones, which are directly adjacent to residential zones and, in some cases, are included in the structure of the residential development, are of great significance to the exterior aspect of cities and to the architectural and esthetic perception of them. Until now these zones have been developed chaotically to a great extent, with temporary buildings and with designs for various enterprises that have not been correlated with each other, a unified engineering network and enterprises for services is not being created, the building

of roads lags sharply, and so on. The maintenance of buildings and roads is at an extremely low level, especially in Nizhnevartovsk and Nefteyugansk. The situation is somewhat better in Surgut.

A Gosgrazhdanstroy commission investigated, with the participation of local party, soviet and economic organizations, the USSR Union of Architects and design institutes, the status of construction in the cities of the Middle Ob', and they made a number of recommendations. Thus, the decisions to develop housing and nonindustrial construction of Tyumenskaya Oblast oil and gas bearing regions have specified not only substantial amounts of construction but also a sharp rise in the quality and the architectural and esthetic level of the buildup and compactness thereof. In accordance with this, the rational placement of new construction, a buildup and improvement of the principal arterials, centers for citywide use, squares and waterfront features, and an increase in the density of the development of microrayons have been called for in the cities of Surgut, Nizhnevartovsk and Nefteyugansk. The Surgut and Nizhnevartovsk DSK's plan conversion to the production of articles in accordance with sectional-unit standard practice, including sectional units rotated at 90 and 135 degrees; an increase in the construction of nine-story buildings; full factory manufacture of outer wall panels; the development of individual designs for separate housing and social buildings; the erection of social buildings based on the MN-04 series framework; and the integrated painting of the existing housing inventory in accordance with specially developed designs. All this should provide for a sharp rise in the quality of the architecture of housing and social buildings.

Measures have been planned for improving the quality of civic improvements, the organization of production at the Surgut DSK of small architectural shapes and elements for civic improvements for an industrialized type of manufacture, the creation in the cities of nurseries for green plantings, and so on. Moreover, measures have been developed for creating assistance in raising the urban-development and architectural quality of cities, for intensifying standard-practice and design assistance by SibZNIIEP (Nizhnevartovsk), LenZNIIEP (Surgut) and LenNIIPgradostroitel'stvo (Nefteyugansk), and for an extension of help by the USSR Union of Architects with patron-type assistance in the layout and buildup of the cities of Surgut, Nizhnevartovsk and Nefteyugansk, and of Nadym and Novyy Urengoy.

During his trip to cities of Siberia and the Far East, CPSU Central Committee General Secretary and USSR Supreme Soviet Presidium Chairman Leonid Il'yich Brezhnev emphasized that in the regions being assimilated "...good living conditions must be established, more attention must be paid to the construction of housing, clubs and schools, and this must be done with the necessary sweep and at the proper engineering level, taking climatic conditions into account. This task is thoroughly a party task."

The architects who are working on the layout and development of cities and settlements of the Middle Ob' have adopted this instruction as a concrete, purposeful program for creative activity.

FOOTNOTES: Stroyizdat, 1980

1103

2202 8144/8697

CONSTRUCTION

TABLE OF CONTENTS: 'STROITEL'NAYA MEKHANIKA I RASCHET SOORUZHENIY,' 1981

Moscow STROITEL'NAYA MEKHANIKA I SOORUZHENIY in Russian No 6, 1981 (signed to press 20 Nov 81) pp 80-82

[Text] Editorials:

"New Stage in Building Communism," No 1

A. F. Smirnov, "On the Main Directions of Scientific Research on the Theory and Methods of Calculating Installations in the 11th Five-Year Plan," No 1

"Increasing the Country's Scientific-Technical Potential," No 2

"Leninist Policy of Communist Creation and Peace," No 3

"Program of Continued Growth in the Well-Being of the People," No 4

"CPSU Economic Policy at the Present Stage," No 5

"The Most Important Principle of Party Economic Strategy," No 6

All-Union Socialist Competition:

O. N. Suslov, "Greeting the 26th CPSU Congress With New Labor Achievements," No 1

"Obligations Assumed in Honor of the 26th CPSU Congress Are Met," No 2

N. P. Mel'nikov, "Obligations Met, Competition Continues," No 3

V. N. Pivovarenko, "NIISK [Scientific Research Institute of Construction Components] at the Start of the 11th Five-Year Plan," No 4

V. I. Korolev, "Labor Victory of the Promstroyproyekt Institute Collective," No 6

Reliability of Construction Components:

A. M. Ayzen and D. M. Rotshetyn, "On the Probability of Evaluating Snow Weight," No 5

P. L. Vizir, "Evaluating the Reliability of a Parallel Structure With Consideration of Load Redistribution," No 1

G. P. Doroshuk, "Certain General Probability Tasks of Component Strength and Reliability," No 3

S. V. Yelizarov, "Evaluating the Reliability of Multistory Frames With Consideration of Plastic Deformation of Cross Bars," No 6

- K. S. Lositskaya, "On the Reliability of Components on Discrete Supports With Irregular Characteristics," No 2
- O. V. Luzhin, G. Ya. Pochtovik and O. G. Solov'yeva, "Evaluating the Reliability of A High Large-Panel Building Based on Support Panel Strength Monitoring Results," No 5
- V. A. Otstavnov, A. F. Smirnov, V. D. Rayzer and Yu. D. Sukhov, "Recording Building and Structure Responsibility in Construction Component Planning Norms," No 1

Optimum Planning Questions:

- M. V. Banichuk and A. D. Larichev, "Optimizing Sectional Reinforcing Bars for Compression and Flexing," No 6
- A. S. Dekhtyar', "Optimum Planning for Ribbed Linings," No 3
- I. A. Kalinin, "Using Mathematical Programming Methods to Optimize Linings," No 1
- M. B. Arakovskiy, "Studying the Sensitivity of an Optimum Resolution for Change in Initial Data When Planning Reinforced Concrete Components," No 2
- I. S. Sholopov, "Optimizing Statically Defined Variable-Section Rods Using Modular K0 Curves," No 2
- G. N. Shabliy and N. P. Zhuk, "Optimal Circular Plate Planning," No 6
- M. A. Yankelevich, "Optimizing Ribbed Reinforced Concrete Slabs for Multistory Industrial Building Roofs," No 5

Calculating Strength:

- A. B. Anatol'yev, A. R. Shenderov and R. P. Petrov, "Studying the Dimensional Performance of Articulated Silo Linings Using the End-Element Method," No 3
- P. M. Bich, "Calculating Pipe Concrete Strength," No 6
- I. P. Varshavskiy and A. G. Tarasov, "Arch-Formation Features in Conical Hoppers With Vertical Walls," No 5
- K. A. Gaydarov and V. N. Mastachenko, "Theory of Simulating Construction Components on a Probability Basis," No 1
- A. A. Gvozdev, "Tasks and Prospects in Developing Reinforced Concrete Theory," No 6
- G. A. Geniyev and N. S. Blokhina, "Theory of Two-Dimensional Uniaxial Stress States," No 1
- G. A. Geniyev, "Strength Criteria of Wood in a Two-Dimensional Stress State," No 3
- I. I. Gelfand, "Calculating the Expansion Zones of Metal Truss Components Moving in Concert With a Membrane," No 5
- Pl. B. Yeremeyev, "Studying The Action of the Closed Support Contour of Membrane Linings," No 4
- I. I. Yer'khov, I. A. Monakhov and V. I. Sebekina, "Calculating Plates and Linings on Elasticity When Greatly Bent," No 6
- S. V. Zhukova, V. A. Otstavnov and O. G. Sulaberidze, "Determining Snow Loads on Modular Roofs Based on Model-Testing Results," No 6
- A. T. Zhukov, "Upper Deformation Values for Girder and Flat Frame Adaptability," No 3

- K. N. Illenko, "Graphic-Analytical Research on Kinetically Variable Suspension and Mixed Systems," No 2
- Yu. N. Kardovskiy, "One Numerical Method in Concrete Creep Theory," No 2
- G. V. Kiziriya, G. I. Gvinchidze and G. G. Dzodzuashvili, "Determining Stresses in Nonuniform, Statically Indeterminate Components With Consideration of Nonlinear Concrete Creep Deformation," No 3
- Ye. B. Koreneva, "Antisymmetric Flex in a Circular Plate of Linearly Variable Thickness Lying on a Base With Two Flex Characteristics," No 3
- V. I. Klimanov and V. V. Chupin, "Calculating Flexible Sectional Rotation Linings for Axisymmetric Effects," No 2
- V. I. Kudashov and V. P. Ustinov, "Calculating Modular Reinforced Concrete Components With Consideration of Physical Nonlinearity and Fissuring," No 4
- A. A. Kulagin, "Resolution Function of a Nonuniform Task for a Thin Spherical Lining," No 5
- P. G. Labozin, "Calculating Sectional Plates Made of Nonuniform Materials," No 6
- V. V. Larionov and Kh. M. Khanukhov, "Choosing Steel for Cyclically Loaded Components," No 1
- V. P. Mal'tsev, "Determining Temperature Loads in Prismatic Components," No 3
- A. M. Maslennikov and V. I. Pletnev, "Calculating Multicellular Channel Systems With Slack Using the End-Elements Method," No 4
- S. A. Matveyev and I. A. Mednikov, "Calculating the Open Angle of a Concrete Roof Slab With Single-Side Connections to the Foundation," No 6
- R. N. Matselinskiy and V. Ye. Sadokho, "Calculating KZhS Lining Panels Supported by Columns," No 2
- V. I. Myachenkov and V. N. Yusov, "Deformation of Lining Components Made of Nonlinearly Elastic Material," No 1
- A. S. Obukhov, "Calculating Cylindrical Underground Vessels and Pipelines," No 6
- I. G. Ovechinnikova, "Studying Glued Wooden Beams on Glued-In Cores," No 4
- R. U. Ol'shevskiy, "Approximation Method of Studying the Equilibrium of Flexible Pipelines," No 4
- I. A. Plotnikov, "Determining Moduli of Elasticity and Poisson's Ratios for Regular-Structure Large-Panel Walls," No 3
- V. I. Reut and N. G. Suslina, "Efficient Design for Strips Fastening an Open-Profile Thin-Walled Core," No 3
- G. V. Savich-Demyanyuk and B. S. Gol'dfayn, "Studying the Fissuring Model in Bent Reinforced Concrete Elements on the Basis of a Numerical Experiment," No 3
- V. N. Skopinskiy, "A Cylindrical Lining Under Local Loads," No 4
- V. I. Slivker, "Designating the Characteristics of a Two-Parameter Flexible Foundation," No 1
- O. D. Tananayko, "Approximation Resolution of Problems of Elasticity Theory Using Modular Rod Grids," No 1

- O. D. Tananayko, "Calculating Anisotropic Plates Based on a Discrete Quasi-Core Model," No 4
- V. K. Chaadayev, "Experimental Study of the Sectional Component of a Suspended Roof," No 5
- A. A. Chiras, "Dual Mathematical Model to Analyze an Elastoplastic Core Under Various Loads," No 2
- B. V. Churikov, "Impact Factors for Symmetrically Loaded Spherical Linings and Evaluating Error Using the Shtayerman-Heckeler Method," No 2
- A. V. Shimanovskiy, "Several Problems of End Rigidity Thread Statics," No 6

Stability Calculations:

- A. Yu. Yevkin, Ye. F. Prokopalo and A. Kh. Shukurov, "Studying Supercritical Forms of Equilibrium of a Longitudinally-Compressed Cylindrical Lining," No 6
- I. S. Malyutin and A. A. Bagdasar'yan, "Stability of an Orthotropic Cylindrical Lining Connected to Longitudinal Ribs by Flexible Connectors," No 6
- A. I. Manevich, "Interactions of Forms of Stability Loss of a Compressed Fastened Panel," No 5
- V. B. Nasonikin, "Refining Stability Equations for Thin-Walled Cores, V. Z. Vlasov's Theory," No 2
- V. B. Potapov, "Stability of Viscoelastic Components With Consideration of the Age of the Material," No 3
- E. V. Tret'yakova and S. I. Avanesov, "Studying the Supercritical Behavior of Tubular Eccentrically Compressed Cores," No 1
- E. V. Tret'yakova, "Computer Calculation of Core Slabs and Linings With Consideration of the Deformation Features of the Elements, Given Elastic and Elastoplastic Use of the Material," No 3
- G. A. Tyupin and G. N. Brusentsov, "Calculating Flexible Stone Pillars for Eccentric Compression," No 3

Dynamic Calculations:

- V. V. Granik, "Theory of Dynamic Pressure of Bulk Materials on Silo Walls," No 5
- V. L. Ivanov and V. N. Kukudzhanov, "Studying Deformation Wave Processes of Flexible Spherical Domes Under Shock Pressure Load," No 6
- L. S. Nazaryan, "Studying Free Fluctuations of Flexible Systems With Piecewise-Continuous Parameters," No 2
- N. K. Lebedeva, "Method of Initial Parameters in Problems of Free Fluctuations of Variable-Thickness Circular Plates," No 1
- V. A. Iesnichaya, L. I. Manevich, L. I. Morozova and V. I. Ruzin, "A Dynamic Two-Dimensional Problem of Flexibility Theory for a Rectangle," No 1
- Yu. A. Miropol'skiy, L. G. Konev and Yu. Ya. Zakharov, "Determining Vibration Amplitude for Automatic Forging-Stamping Machines," No 4
- G. A. Marayevskiy, "Oscillations of a Girder Lying on a Winkler Foundation in Response to a Moving Harmonic Force," No 3

G. A. Nekhayev and G. N. Telichko, "Inherent Oscillations of a Heavy Flexible Thread," No 6

M. M. Osipov, "Determining Reinforced Concrete Silo Wall Deformations in Response to the Dynamic Pressure of Bulk Contents," No 6

V. I. Pozhuyev, "Response of a Cylindrical Lining - Flexible Medium System to a Moving Load," No 6

I. M. Reznikov and G. M. Fishman, "Effectiveness of Dynamic Oscillation Attenuators for Nonstationary Random Forces," No 1

Ye. S. Sorokin, A. S. Arkhipov, A. L. Yemel'yanov and V. D. Bogatskiy, "Ascending Pipe Oscillations in Terms of High Harmonics," No 3

G. T. Tarabrin, "Using the Bicharacteristics Method to Resolve Nonstationary Tasks of Anisotropic Mass Dynamics," No 4

A. I. Tseytlin, "Recording Internal Friction in Normative Documents on Dynamic Calculations for Installations," No 4

Calculating Seismic Forces:

V. V. Bolotin, "Statistical Simulation in Seismic Stability Calculations," No 1

A. I. Bokhonskiy and L. Sh. Kilimnik, "Spatial Oscillations of Elastoplastic Systems in Response to Seismic Forces," No 5

G. A. Zelenskiy, B. V. Rakov and V. N. Tishchenko, "Dynamics of Seismic Shock-Insulated Buildings," No 2

Yu. I. Nemchinov and A. V. Frolov, "Calculating Buildings and Structures by the Method of Modular Elements," No 5

G. G. Pritykin, "Approximation Recording of Seismic Wave Diffraction on Circular Elaborations and Inclusions," No 6

From Planning Organization Work Experience:

I. M. Balkarey and V. D. Derechin, "Free Oscillations of Vibration-Insulated Systems With Soft Nonlinear Characteristics," No 1

E. M. Lur'ye and G. N. Grigor'yeva, "Determining Rod Stresses by the Vibration Method," No 3

L. L. Pan'shin, "Evaluating Maximum Load for Frame-Panel Buildings With Consideration of Stress Redistribution," No 5

Yu. M. Sazanovich, "Experimental Research on an Extension-Type Aluminum Lining," No 2

G. I. Sliykhet, "Calculating Silo Walls for the Vertical Composite Pressure of Loading Contents," No 5

V. P. Yakki, "Statistical Calculation of a New Type of Modular Folding-Guy Roof," No 1

To Help Planning Organization Workers:

G. Ye. Bel'skiy and V. D. Nasonkin, "Calculating Steel Components for Refractoriness Using the Maximum States Method," No 5

- G. Ye. Bel'skiy and L. A. Gil'dengorn, "Calculating Steel Columns of Complex Cross-Section," No 6
- A. A. Voyevodin, "Change in Longitudinal Thrust Due to Transverse Load in a Two-Zone Guy System," No 6
- V. P. Kochetov, "Improving Selection of the I-Beam Section of Continuous Compression-Cambered Cores," No 5
- Yu. I. Nemchinov and N. G. Mar'yenkov, "Substantiating Normative Requirements for Determining Transport Loads on Construction Components," No 1
- O. N. Tot'skiy, "Using Multilayer Slabs and Girders on a Winkler Foundation," No 5

New Norms and Instructions:

- A. A. Bar' and A. Ye. Segalov, "Loads for Calculating and Testing Load-Bearing Construction Components for Fire-Resistance," No 4

Foreign Experience:

- Sh. Kaliski, P. Dyordi and A. Lovash, "Hungarian Experience in Planning and Calculating Frame-Panel Buildings for Precipitation," No 4
- D. Pime, "Resistance of Nonreinforced Joints in Concrete Elements to Shearing and Compression," No 5
- V. Royk, "Interaction of a Panel Building and Its Foundation," No 4
- D. N. Partov and V. G. Chernogorov, "Calculating Sectional Girders With Consideration of Concrete Creep and Shrinking," No 6

Brief Reports and Observations:

- Yu. L. Avanesov, "Quality of Securing the Core of a Cyclically Symmetrical Bar System," No 4
- A. I. Kozachevskiy, "Calculating Complex Utilities Installations Using the Unified Computer System," No 4
- K. K. Mukhanov and G. A. Savitskiy, "Calculating Steel Components With Consideration of Wind Type and Duration," No 4
- L. L. Pan'shin, "Tangential Stresses During Eccentric Compression of Cores," No 4
- T. P. Pererasheva, A. S. Saulin and V. A. Lebedev, "Temperature Fields in Elements of Metal Components Made from Single Rolled Sections," No 2
- K. I. Kulishev, "One Method of Analyzing Statically Indeterminate Systems," No 1
- V. P. Khleborodov, "Calculating a Closed Thin-Walled Rectangular-Section Core With One Axis of Symmetry," No 3
- B. M. Chentemirov and A. V. Granovski, "Calculating Platform Joints Using a Computer," No 2
- V. T. Chernov, "One Method of Writing and Solving Differential Equations in Final Differences," No 1

Unpublished Literature:

- G. A. Khaydukov, "International Symposium on Lightweight Modular Components," No 3

Criticism and Bibliography:

B. G. Korenev, "A Useful Book ('Spravochnik po spetsial'nym funktsiyam s formulami, grafikami i matematicheskimi tablitsami' [Handbook on Special Functions With Formulas, Graphs and Mathematical Tables], Moscow, Nauka, 1979)," in No 3

P. A. Lukash, [on the book] "Zadachi teorii teploprovodnosti i termouprugosti. Resheniya v besselevykh funktsiyakh" [Problems of Thermal Conductivity and Thermoelasticity Theory. Solutions in Bessel Functions], by B. K. Korenev, Moscow, Nauka, 1980, in No 2

N. N. Skladnev, [on the book] "Optimal'noye proyektirovaniye izgibayemykh sistem" [Optimum Deflection System Planning], by D. Rozhvany, Moscow, Stroyizdat, 1980, translated from the English, in No 5

R. A. Khechumov, [on the book] "Metod konechnykh elementov v mekhanike razrusheniya" [Method of Finite Elements in Destruction Mechanics], by Ye. M. Morozov and G. P. Nikishkov, Moscow, Nauka, 1980, in No 4

Anniversaries:

60th birthday of A. P. Filin, No 3

70th birthday of K. M. Khuberyan, No 5

65th birthday of Kh. P. Vyrbanov, No 5

Information:

Nos 1, 2 and 3.

COPYRIGHT: STROYIZDAT, 1981

11052

(30: 1821/071)

BUILDING MATERIALS

DC 691.327:666.974.2

EXPANDED USE OF HEAT-RESISTANT CONCRETES AT HOT SPOTS URGED

RUSSIAN SOURCE: ZHILYAZHETON in Russian No 12, Dec 81 (signed to press 16 Nov 81) p 4

(Information: "Expansion of the Production of Heat-Resistant Concretes and Structures")

[Moscow] The 12th CPSU Congress set for the current five-year plan the tasks of raising the level of industrialization of construction work and the degree of factory preparation of structure and parts, expanding the use of new and effective materials and structure, and raising labor productivity in construction work by 10-17 percent.

One of the important problems now is industrialization of a most complicated field of construction—the erection of industrial furnaces. Basically, small refractory brick masonry is being used here. The use of large blocks and panels made of heat-resistant concrete and reinforced concrete will enable the elimination of manual labor, a reduction in costs, a reduction and in some cases even elimination of the use of refractories, a reduction in erection time, and an increase in the reliability and longevity of operation of thermal units.

The advantages of using heat-resistant concretes instead of small-brick refractory materials lies in the fact that they enable the level of industrialization of erecting thermal units to be raised, allowing the construction pace to be accelerated 3-fold to 4-fold; the cost of construction to be reduced by 20-40 percent and labor expenditure to be cut to one-half or one-third; the service life and productivity of thermal units to be increased; and labor and monetary expenditures for periodic repair and overhaul to be reduced. This will also enable more rational use of heat-resistant concretes and refractory items, thereby saving up to 40-50 cubic meters of concrete in comparison with small refractory brick, through the use of less expensive materials and mechanization of the erecting work.

Heat-resistant concretes are already being used at many thermal units and in corresponding structure—in footings under industrial furnaces and smokestacks, in tunnel furnaces and parts at building-materials enterprises, and in gas conduits, smokestacks, the collectors and dust chambers of cinderling machines, the bottoms of aluminum electrolytic reduction cells, the furnaces of petrochemical and oil-refining enterprises, large boiler installations at thermal electric-power stations, fluidized-bed furnaces, slag chambers and regenerators of open-hearth furnaces, feeding pits, coke batteries, furnaces for pouring secondary aluminum, flares for slagmaking, rolling, blast-furnace and other hot shops of industrial enterprises, in artificial drying, and so on.

The process of producing large blocks and prefabricated structure made of heat-resistant concrete and reinforced concrete is similar to the manufacture of ordinary construction articles and structure. Construction and installing organizations of USSR Minmontashspetsstroy (Ministry of Installation and Special Construction work)—Soyuztepleystroy (State Union Trust for Construction and Installation of Ventilation Heat-Engineering Facilities) and Tepломontazh (Heat-Engineering Equipment Installation Trust)—and other trusts have begun to introduce these materials.

At the country's oil refineries, about 100 flamefree combustion tube heaters were built of heat-resistant concrete and are operating successfully. The economic effectiveness from replacing the metal housing and small refractory masonry with concrete blocks and reinforced-concrete panels is about 150 rubles for 1 m³ of masonry. The rebuilding of 1,000 pyramidal-type furnaces with the use of large blocks and panels made of lightweight heat-resistant concrete will enable savings of 10 million rubles. In so doing, the amount of refractory lining work is cut by 50 percent, materials intensiveness is reduced 1.6-fold, and 200,000 tons of refractory materials are saved. Large panels made of lightweight heat-resistant reinforced concrete will serve as reliable lining for tube heaters. There are only one-fifth as many joints here as in refractory brick masonry, and that means fewer vulnerable spots.

More than 2,000 smokestacks are erected in our country annually. The erection of stacks up to 45 meters high with prefabricated heat-resistant reinforced concrete has won wide recognition. Already more than 500 such stacks have been built and are in operation. In building prefabricated heat-resistant reinforced-concrete stacks 45 meters high, the weight of the structure is reduced 7.5-fold in comparison with stacks made of brick, labor expenditure is one-fourth as great, construction time is reduced 6-fold, and total cost of the work is reduced by 10 percent. The shape and finish of stacks made of prefabricated heat-resistant reinforced concrete and their external appearance differ advantageously from brick ones and enter well into ensembles of buildups of city housing rays.

Thus, practice indicates the high economic desirability of using heat-resistant concrete in construction and industry. In 1980 more than 300,000 m³ of them were used, yielding the country's economy an economic benefit for the year of more than 30 million rubles. By the end of the 11th Five-Year Plan the introduction of heat-resistant concretes should increase. In this case, a large amount of refractory brick and metal will be saved. However, the overwhelming majority of thermal units are still being made of refractory brick in a metal housing or jacket.

Compositions of heat-resistant concretes for use over a broad temperature range (100-1,200 degrees C), the technology of factory production of articles made from them, and the principles of design and analysis of heat-resistant concrete and reinforced-concrete structure have now been developed. The required standardization documents—GOST's (State All-Union Standards), SNiP's (Construction Norms and Regulations), instructions, guides and recommendations—exist.

Now the prerequisites for large-scale application in construction of thermal units and of constructional structure made of heat-resistant concrete and reinforced concrete that operate at elevated and high temperatures have been created.

Required are further assistance of USSR Gosplan, USSR Gosstroy and the concerned Ministries, primarily USSR Minnermet (Ministry of Ferrous Metallurgy), USSR

Minstroyaterialov], USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] and USSR Mintsvetmet [Ministry of Nonferrous Metallurgy in getting large-block and panel structure made of heat-resistant concrete and reinforced concrete included in the plan of leading design organizations and in the design of thermal units; execution of design work, the construction of new plants, and the rebuilding of existing bases for the manufacture of heat-resistant concrete and reinforced-concrete articles; and organization of the manufacture and shipment of source materials and dry concrete mixes for heat-resistant concretes.

The main directions of technical progress in this field are the creation of high-strength heat-resistant concretes with increased density and longevity, the development of new, highly effective compositions for lightweight, especially lightweight cellular concretes, and the use of aggregates with high physical and chemical characteristics.

Also required are: further development of new structure with greater factory preparation for thermal units that are light in weight and with improved heat-engineering characteristics, using prefabricated blocks and panels made of lightweight high-strength heat-resistant concretes; the creation of more improved prefabricated members; the unification of dimensions; and reduction in the weight of structure.

COPYRIGHT: Stroyizdat, 1981

11409

CSO: 1821/066

BUILDING MATERIALS

BRIEFS

PANEL PLANT UNDER CONSTRUCTION--Brest. A new enterprise is being equipped in the city's eastern industrial center--a plant for the manufacture of large panel building materials. It is located on more than 15 hectares. The production of the new plant is 120,000 square meters of panel. [By Z. Marinin]
[Text] [Minsk SOVETSKAYA BELORUSSIYA in Russian 16 Mar 82 p 2]

CSO: 1821/95

END

END OF

FICHE

DATE FILMED

April 7, 1982

